PRELIMINARY ASSESSMENT
PA

AVERY RAILROAD DUMP AND ROUNDHOUSE
IDD 984666313
T45N R5E NE 1/4 SEC. 16
AVERY, IDAHO 83802

May 9, 1991

Prepared for: U.S. Environmental Protection Agency
Region 10
Superfund Program Management Section
Seattle, Washington 98101

Prepared by: Idaho Department of Environmental Quality
1410 N. Hilton
Boise, Idaho 83706-1253

886554

PAL 002203

Executive Summary

The abandoned Avery Railroad Dump and Roundhouse facility is located in Avery, Idaho on the north bank of the St. Joe River. The natural setting consists of a narrow river valley confined by very steep, forested mountains. The site served as a switching station and light maintenance facility for the Chicago, Milwaukee, St. Paul and Pacific Railroad Company from 1909 to 1977. The site is now owned and managed by Potlatch Corporation.

Presently, a portion of the riverbank on the southern boundary of the site is covered by a tarry black substance, and an oily seep can be observed in the river in this same area.

A two-phase environmental assessment of the site was completed in the fall of 1989 by Hart Crowser for Potlatch. Initially, a sample was collected from a free-floating oily layer in monitoring well MW-11, an existing well from a previous study. The sample was analyzed for chlorinated volatiles, cadmium, chromium, lead and PCBs. Chromium, lead and PCBs were detected in the sample leading Hart Crowser to characterize the floating layer as a waste oil. In the second phase of this study, the installation of four monitoring wells and subsequent sampling of these wells, and chemical analyses of both groundwater and the waste oil from these wells were completed. The ground water samples were analyzed for total petroleum hydrocarbons (TPH) and dissolved metals (arsenic, cadmium, chromium, and lead). The waste oils were analyzed for EP Tox metals, PCBs, PNAs, total halogenated hydrocarbons, and total metals (cadmium, chromium, lead and arsenic).

Chemical analyses of these ground water samples did not detect any TPH. Of the dissolved metals only arsenic was detected (0.009 ppm). Analyses of the waste oil found in the wells indicated no detectable concentrations of PNA compounds, PCBs and total halogenated compounds. Of the EP tox metals only barium was detected (0.005 ppm). Total chromium and total lead were detected at 1ppm and 5ppm, respectively. These results are inconclusive, however, as detection limits for the PCBs were higher than the reported valves from the earlier phase of the study. PNAs were not detected, but detection levels for these compounds were high, ranging from 200 to 1400 ppm and did not provide meaningful results for these parameters.

Preliminary Assessment
of
Avery Railroad Dump & Roundhouse
IDD984666313
Avery, Idaho 83802

1991

Prepared for : U.S. Environmental Protection Agency
Region 10
Superfund Program Management Section
Seattle, WA 98101

Prepared by: Idaho Division of Environmental Quality
1410 N. Hilton, Suite 101
Boise, ID 83706-1253

Avery Railroad Dump & Roundhouse

Introduction

Pursuant to Cooperative Agreement V000409-01 between the U.S. Environmental Protection Agency (EPA) and the Idaho Division of Environmental Quality (DEQ), the DEQ conducted a Preliminary Assessment (P.A.) at the site known as Avery Railroad Dump and Roundhouse.

PA's are intended generally to identify potential hazards at sites, to identify sites that may require immediate action where a substantial danger to public health or environment exists, and to establish priorities for sites requiring further investigations (Site Inspections) under the Comprehensive, Environmental Response, Compensation and Liability Act (CERCLA), possibly leading to placement of the site on the National Priorities List (NPL). The

PA is based on readily available information about the site including some limited field reconnaissance and investigation and is not a full investigation or characterization of the site.

The Avery Railroad Dump and Roundhouse PA is conducted to identify potential public health and environmental threats related to the site. The PA is based on data derived from the sources listed in Section I.

A. General Site Data

Site Name: Avery Railroad Dump and Roundhouse

Location: Avery, Idaho

Owner: Potlatch Corporation
PO Box 386
St. Maries, Idaho 83861

Operator: Site is not operational

Contact: Mike Fish
Potlatch Corporation
PO Box 386
St. Maries, Idaho 83861
(208) 245-2585

B. Site Description

The site is the former location of the Chicago, Milwaukee, St. Paul and Pacific Railroad Company's roundhouse, turntable, and maintenance facilities in Avery (Township 45 N, Range 5 E Sections 15 and 16 - Attachment 2). The site comprises approximately 7 acres. The railroad facilities appear to have consisted of (from a plat dated October 5, 1915 - Attachment 3) a turntable, a

roundhouse (consisting of a machine shop, fan house and engine house), a boiler house, various store houses, a coal dock, an oil house, oil tanks (including a 500,000 gallon fuel oil tank), oil "sinks", various "drains", and a pump house.

The closest permanent structures to the site are the various homes and buildings comprising the town of Avery (on both sides of the St. Joe River). The nearest permanently occupied building is located 600 feet west of the site. The majority of the buildings comprising Avery are spread along both the north and south banks of the St. Joe River for approximately one mile upstream (east) and one-quarter mile downstream (west). The site itself is currently used for a staging and parking area by Potlatch. Potlatch has also used the site for temporary storage of logs. There are currently two temporary "camp" buildings (approximately 10' x 20') on site. The western side of the facility, immediately north of where the St. Joe River curves to the northwest, has been leased in the past to contractors needing to locate trailers for workers. The same area may again be leased for the upcoming summer construction season. A trailer park was located here from May through October, 1990. The area near the site is mountainous, with steep forested slopes rising immediately on both the north and south sides of the town. The site is bordered on the south in its entirety by the St. Joe River (1). The north side is bordered by the newly constructed St. Joseph River road and the steep south facing slope of Avery Hill. The east and west sides of the site both narrow to

a point bordered on the south by the St. Joe River and on the north by the slope of Avery Hill with only the road right-of-way separating the river and the slope. (1, Attachment 1)

C. Ownership Information

Potlatch Corporation obtained ownership of the approximate western two-thirds (5 acres) of the Avery site in 1980. The eastern third, including an area of riverbank contaminated by the oil seep, is owned by a David Thierault who inherited this property from his grandfather, Harold Thierault. The strip of land comprising the northern boundary of the site was sold by the Thierault Estate to the Federal Highway Administration in 1986 for construction of the St. Joe River Road (10). Prior to 1980, the site was owned by the Chicago, Milwaukee, St. Paul and Pacific Railroad ("Milwaukee Road"). The railroad operated the rail yard from 1909 till approximately 1977. The Milwaukee Road was in reorganization under bankruptcy from 1977 to 1985 and afterwards emerged as the CMC Real Estate Corporation. The CMC Real Estate Corporation was merged into the Chicago Milwaukee Corporation (CMC) in 1989, and has since undergone further corporate restructuring into Heartland Partners and CMC Heartland, collectively known as "Heartland" (10).

D. Hazardous Substance Activities and Potential Problems

An area of concern is associated with a 500,000 gallon fuel oil tank, formerly located in a gully on the north side of the site, to the northeast of the turntable and roundhouse complex. The tank

common practice in the past at similar railroad facilities around the country containing both a turntable and roundhouse. However, Chet Johnson, an Avery resident and retired railroad worker, stated otherwise. Mr. Johnson worked on the Chicago, Milwaukee, St. Paul and Pacific Railroad in both Montana and Idaho (Avery) for a total of nearly 30 years. He stated that most of the heavy maintenance was conducted at Deer Lodge, Montana. The facilities in Avery conducted only minor repairs and he could not recall the use of any degreasing agents or their disposal (5). No chemical analyses completed to date have revealed any halogenated volatile compounds commonly found in solvents. The only volatile compounds detected are the BETX (benzene, ethylbenzene, toluene, xylenes) petroleum constituent (Attachment 5).

Transformer Oils

Because Avery was the end of the electric line for trains heading east, a substation is reported by Mr. Stranohon of the United States Forest Service (USFS) to have been located near the Avery town well located approximately three-fourths of a mile east of the site near the confluence of Avery Creek and the St. Joe River (1, Attachment 1). This substation included stored transformers and tanks or vaults for storing transformer oil. Whether or not these were PCB containing oils has not been determined (1). Mr. Johnson stated that he recalled transformers were stored at various locations on-site, but could not remember what happened to them or where exactly they had been stored relative to the facilities shown

construction crews and their trailers utilize the area just west of the site. Then a maximum of 20 people may utilize this well during the construction season. One well serves the Log Cabin Inn and Motel located directly across from the site on the south side of the river. The well serves one residence and is used by the restaurant, bar and motel (1 apartment, 4 rooms). There is also space for eight trailers on the premises. These are occupied only seasonally. A USFS well is located above the Avery Water and Sewer well, on the divide between Avery Creek and Fortynine Gulch (Attachment 1). This well is utilized seasonally, with no use in the winter and a maximum of approximately 10 USFS workers in the summer. The Avery school well, located across the river and southeast of the site, serves 21 residents, in addition to the children and personnel at the school which at present totals 29. The sixth well is located approximately one and one-quarter miles west of the site near the confluence of Fishhook Creek and the St. Joe River. This well supplies domestic water for a residence at that location (4). For the required distances from the site, the wells and estimated associated populations are as follows:

Distance from Site (Miles)	# of wells	Estimated Population (Includes seasonal range)
0 - 1/4	2	8 - 48
1/4 - 1/2	0	
1/2 - 1	2	86 - 125
1 - 2	2	4 - 12
2 - 3	0	
3 - 4	0	
Total	6	98 - 185

The average annual precipitation for the area, as measured at St. Maries downriver, is 30.1 inches (3). The annual free water surface evaporation is 28 inches (11), which results in an annual net precipitation of 2.1 inches. However, the evaporation measurement reflects a recording period from May through October, the driest period of the year. Although rain is common in the summer, the highest precipitation is during the winter months when evaporation is minimal, thus resulting in increased infiltration or actual net precipitation.

No wellhead protection areas have been designated.

Surface Water

There are no quantitatively documented known releases to surface water other than the oily substance described in

Section D. The presence of chromium, lead, and PCBs in the sample obtained from monitoring well MW-11 raises questions as to the presence of waste oils at the site and in the river (6).

The main contaminants of concern would be PCBs and heavy metals entrained in an oily base, possibly waste oil.

There are no obvious overland surface migration paths at the site for contamination to enter surface waters and no current operations at the site that could serve as a source for contamination to surface waters (1). The same groundwater flow that is transporting product into the St. Joe River could be capable of contributing other contaminants, such as those detected in the floating layer (PCB, lead, chromium) to the river. The site itself lies adjacent to the St. Joe River in the east-west direction for approximately 1500 feet (Attachments 1, 2). There are no records to indicate whether or not the site lies within the St. Joe River flood plain for any particular event (25 year, etc.). The Shoshone County Zoning and Planning Department has no flood plain data for the upper St. Joe above Calder (9). However, a rain event in November, 1990 created one of the highest flows (higher than peak spring runoff) in recent memory according to long time Avery residents. The town and

specifically the site remained well above the high water mark (8, 9).

The average monthly flow for the St. Joe River as measured at Calder (30 miles downstream) varies from an average September low flow of 500 cubic feet per second (cfs) to an average May high flow of 8560 cfs. The average annual flow is 2408 cfs (3).

There is no known use of the river for drinking water immediately downstream of Avery. Calder (30 miles downstream) does not utilize the river for potable water and neither does St. Maries, another 20 miles downstream beyond Calder (8).

The St. Joe River is popular for sport fisheries and is classified as a "Special Resource Water" by the State of Idaho. Based on a 1990 fish count conducted between Calder and Avery, the fish production in pounds per mile of stream in the 15 miles below Avery is estimated to be 710 lbs/mile. This is based on an average of 947 fish/mile at 3/4 lb. per fish (approximately 10-12 inches). The species counted include cutthroat and rainbow trout and whitefish. No wetlands are indicated in the 15 miles below Avery (1, Attachment 1).

Soils

A release of hazardous substances to surface soils has not been documented. Only groundwater and product samples have been subjected to chemical analyses (Attachment 4). However, the presence of PCBs and heavy metals in the waste oil recovered from beneath the site suggest the possibility of soil contamination through the dumping or spilling of waste oil on the site. Some dark gray staining of soils was observed during the October 1990 site visit in the vicinity of the small camp buildings located in the middle of the site, and west of those buildings near the then present temporary trailers. Some remnant patches of asphalt were observed at the site beneath the more recently laid gravel.

There have been, and will again be during the summer construction season, temporary populations (in trailers) adjacent to the site as described in section B. However, no schools or day care centers are located near the site. The nearest regularly (year-long) occupied structure is a residence owned by a (b) [redacted] located approximately 200 yards west of the site. There is also the Log Cabin Inn & Motel located just to the south-southeast, across the river, again approximately 200 yards distance from the site (1).

Access by humans and animals to the site is both possible and very easy. There are no fences or other barriers present at the site.

H. Summary

This site is a former switching station and apparently "light" maintenance facility for the railroad. The facility operated from 1909 to the late 1970s. No records exist that document hazardous substance releases to groundwater, surface water, or soils, with the exception of relatively recent chemical analyses indicating groundwater contamination by petroleum constituents, and oily wastes contaminated with both lead, chromium and PCBs. The hazardous substances of concern are solvents for degreasing engine parts, transformer cooling oils containing PCBs, and waste oils. Major presumed routes of exposure which will require further analysis include groundwater, surface water, and soil. The surface water of concern is the St. Joe River flowing adjacent to the site. Bioaccumulation of PCBs in aquatic species which are part of the human food chain should be further evaluated. Possible contamination of this resource may have occurred mainly through the groundwater to surface water pathway.

RECOMMENDATIONS

It is recommended that a site inspection of this facility be conducted in order to collect data necessary to complete the Hazard Ranking System (HRS) evaluation for this site. The following recommendations are to assist EPA in determining the eligibility for placement on the National Priorities List (NPL).

1. Undertake a sampling effort at visually impacted areas of the site to further document the presence of CERCLA regulated substances in soil, surface water, groundwater and air through all HRS exposure pathways.

2. To date one sample from MW-11 indicates that CERCLA regulated substances have been released to the environment. Presently, the source for these contaminants is unknown. The source(s) will need to be identified if additional waste quantity is needed to enhance the pathway scores.

3. Given that the floating oil layer on the groundwater has been documented as being contaminated by PCBs, lead, and chromium, we feel sampling of the nearest water supply wells should be conducted to determine if the release is impacting human health. This will be necessary to document a threat to the human target population.

8. Personal communication with Steve Tanner, Water Quality Compliance Officer, Coeur D'Alene Field Office (667-3524) IDEQ.

9. Personal communication with Pat Allen, Public Works (753-5475), Shoshone County Zoning and Planning Department, Wallace, Idaho.

10. Personal communication with Doug Conde, State of Idaho Deputy Attorney General, IDEQ (334-0497), Boise, Idaho.

11. Personal Communication with Myron Molnau, State Climatologist, University of Idaho (885-6182), Moscow, Idaho.

12. Personal communication with Brian Painter, Environmental Hydrogeologist, Coeur D'Alene Field Office (667-3524) IDEQ.

13. Unpublished data provided by Dr. Ted C. Bjornn, Idaho Cooperative Fish and Wildlife Research Unit, College of Forestry, Wildlife and Range Science, University of Idaho (885-6336) Moscow, Idaho.

14. Alt, D.D., Hyndman, D.W., Roadside Geology of Idaho, Mountain Press Publishing Company, Missoula, Montana, 1989.

ATTACHMENTS

Attachment 1: Location Maps

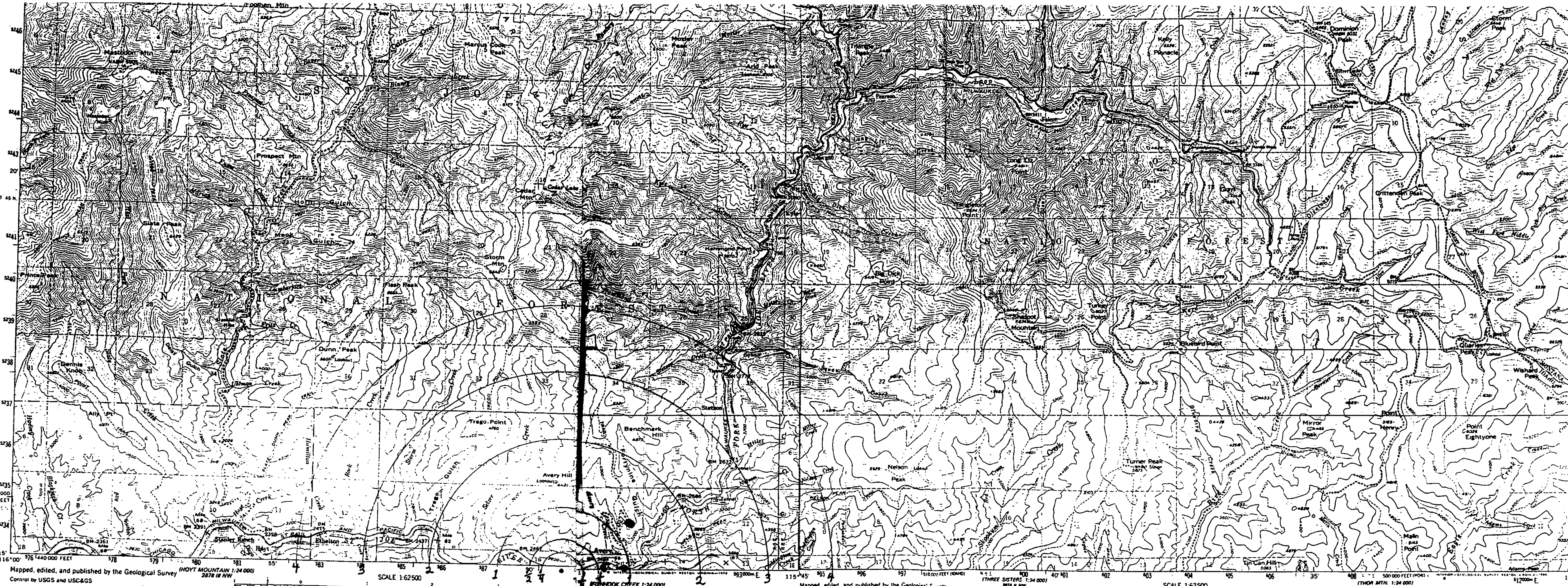
Attachment 2: Facility Map (1915 Plat Map)

Attachment 3: Well logs, Idaho Dept. of Water Resources, Boise Idaho.

Attachment 4: Hart-Crowser Reports and Chemical analysis completed by State of Idaho.

Attachment 5: Fish Count Data and Associated Calculations.

Attachment 1



2778 II NE (MARBLE MTN.) 1:24 000

(HOYT MOUNTAIN 1:24 000) 2878 III NW

(FISHHOOK CREEK 1:24 000) 2878 III NE

(THREE SISTERS 1:24 000) 2878 II NW

(THOR MTN 1:24 000) 2878 II NE

(SIMMONS PEAK) 2978 III

Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography from aerial photographs by ER-55 plotter
Aerial photographs taken 1954. Field check 1957

Polyconic projection. 1927 North American datum
10,000-foot grid based on Idaho coordinate system, west zone
1000-meter Universal Transverse Mercator grid ticks, zone 11, shown in blue

Red tint indicates areas in which only landmark buildings are shown

Dashed land lines indicate approximate locations

Unchecked elevations are shown in brown

UTM GRID AND 1957 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:62500

CONTOUR INTERVAL 80 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

ROAD CLASSIFICATION

Heavy-duty — Light-duty
Medium-duty — Unimproved dirt
U S Route

QUADRANGLE LOCATION

WALLACE, IDAHO—MONT.
N4715—W11545/15

1957

AMS 2878 IV—SERIES V793

Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography from aerial photographs by photogrammetric methods
Aerial photographs taken 1951. Field check 1956

Polyconic projection. 1927 North American datum
10,000-foot grid based on Idaho coordinate system, west zone and Montana coordinate system, central zone
1000-meter Universal Transverse Mercator grid ticks, zone 11, shown in blue

To place on the predicted North American Datum 1983 move the projection lines 13 meters north and 75 meters east

There may be private inholdings within the boundaries of the National or State reservations shown on this map

Dashed land lines indicate approximate locations

UTM GRID AND 1956 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:62500

CONTOUR INTERVAL 80 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

ROAD CLASSIFICATION

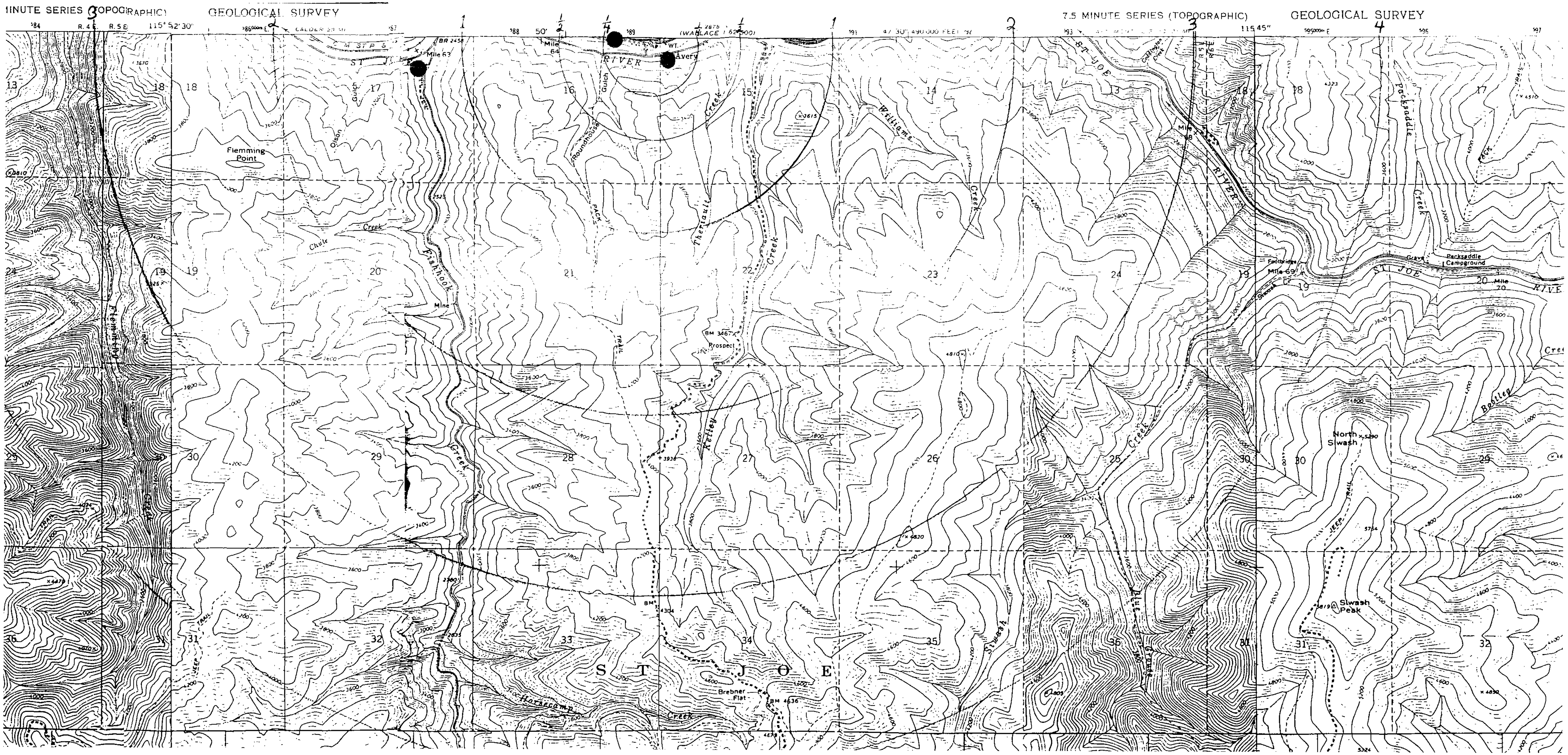
Heavy-duty — Light-duty
Medium-duty — Unimproved dirt
U.S. Route

MONTANA
QUADRANGLE LOCATION

SALTESE, MONT.—IDA.
N4715—W11530/15

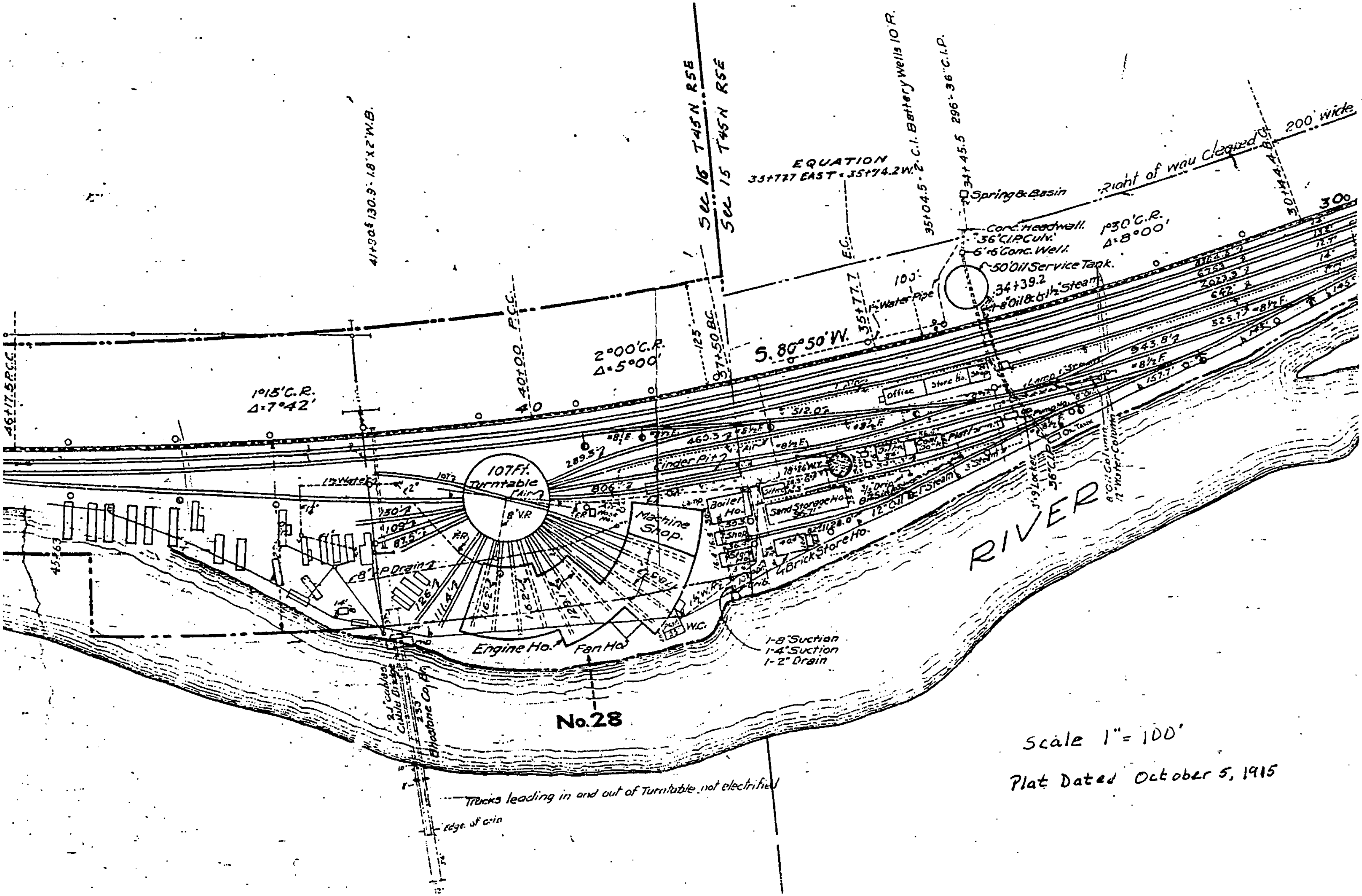
1956

DMA 2878 I—SERIES V794



MINUTE SERIES (TOPOGRAPHIC)
GEOLOGICAL SURVEY
7.5 MINUTE SERIES (TOPOGRAPHIC)
GEOLOGICAL SURVEY
ST JOE
RIVER
Mile 63
Mile 64
Avery
Flemming Point
Olson Gulch
Roundhouse Gulch
Theriault Creek
Williams Creek
Chute Creek
Fishhook
Mine
Creek
Prospect
Kelley Creek
Packsaddle Creek
Packsaddle Campground
Footbridge
Mile 69
Mile 70
North Slwash
Slwash Peak
Bottle Creek
Horsecamp Creek
Brebner Flat
S T J O E

Attachment 2



Scale 1" = 100'

Plat Dated October 5, 1915

Attachment 3

1.

7387

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

USE TYPEWRITER OR BALLPOINT PEN

WELL DRILLER'S REPORT

State law requires that this report be filed with the Director, Department of Water Resources within 30 days after the completion or abandonment of the well.

4

WELL OWNER

Name Owsley School District

Address Owsley, Idaho

Owner's Permit No. ____

7 WATER LEVEL

Static water level 15 feet below land surface.
Flowing? ☐ Yes ☐ No G.P.M. flow 100 GPM
Artesian closed in pressure ____ p.s.i.
Controlled by ☐ Valve ☐ Cap ☐ Plug
Temperature ____ °F Quality ____

NATURE OF WORK

☐ New well ☒ Deepened ☐ Replacement
☐ Abandoned (describe method of abandoning) ____

8. WELL TEST DATA

☐ Pump ☐ Bailer ☒ Air ☐ Other ____

Discharge G.P.M.	Pumping Level	Hours Pumped
100 GPM		

PROPOSED USE

☐ Domestic ☐ Irrigation ☐ Test ☐ Municipal
☐ Industrial ☐ Stock ☐ Waste Disposal or Injection
☐ Other School District (specify type)

9. LITHOLOGIC LOG

Hole Diam.	Depth From	Depth To	Material	Water Yes	Water No
	105	150	gray shale		
	150	160	Barbon shale		
			Total 10 of hole		

METHOD DRILLED

☒ Rotary ☐ Air ☐ Hydraulic ☐ Reverse rotary
☐ Cable ☐ Dug ☐ Other ____

WELL CONSTRUCTION

Casing schedule: ☐ Steel ☐ Concrete ☐ Other PVC

Thickness	Diameter	From	To
4 inches	4 inches	12 feet	150 feet
____ inches	____ inches	____ feet	____ feet
____ inches	____ inches	____ feet	____ feet
____ inches	____ inches	____ feet	____ feet

Was casing drive shoe used? ☐ Yes ☐ No
Was a packer or seal used? ☐ Yes ☒ No
Perforated? ☐ Yes ☒ No
How perforated? ☐ Factory ☐ Knife ☐ Torch
Size of perforation ____ inches by ____ inches

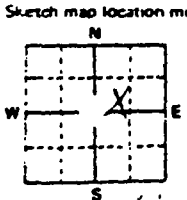
Number	From	To
____ perforations	____ feet	____ feet
____ perforations	____ feet	____ feet
____ perforations	____ feet	____ feet

Well screen installed? ☐ Yes ☒ No
Manufacturer's name ____
Type ____ Model No ____
Diameter ____ Slot size ____ Set from ____ feet to ____ feet
Diameter ____ Slot size ____ Set from ____ feet to ____ feet
Gravel packed? ☐ Yes ☐ No ☐ Size of gravel ____
Placed from ____ feet to ____ feet
Surface seal depth ____ Material used in seal: ☐ Cement grout
Existing ☐ Puddling clay ☐ Well cuttings
Sealing procedure used: ☐ Slurry pit ☐ Temp. surface casing
☐ Overbore to seal depth
Method of joining casing: ☐ Threaded ☐ Welded ☐ Solvent Weld
☐ Cemented between strata
Describe access port ____

10.
Work started 5-16-82 finished 5-18-82

6. LOCATION OF WELL

Sketch map location must agree with written location.



Subdivision Name ____
Lot No. ____ Block No. ____
County Lincoln
¼ ¼ Sec. 15 T 5S N/S, R. 25 E/W.

11. DRILLERS CERTIFICATION 22

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Firm Name Layne Western Co. Firm No. 214
Address Houston Texas Date 5-20-82
Signed by (Firm Official) Fred Family
and
(Operator) Bill Family

USE ADDITIONAL SHEETS IF NECESSARY – FORWARD THE WHITE COPY TO THE DEPARTMENT

238-7

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

USE TYPEWRITER OR BALLPOINT PEN

WELL DRILLER'S REPORT

State law requires that this report be filed with the Director, Department of Water Resources within 30 days after the completion or abandonment of the well.

1. WELL OWNER

Name Richard D. or Jean L. Pacheco

Address Box 76 Avery, Id 83802

Owner's Permit No. _____

2. NATURE OF WORK

☒ New well ☐ Deepened ☐ Replacement
☐ Abandoned (describe abandonment procedures such as materials, plug depths, etc. in lithologic log)

3. PROPOSED USE

☒ Domestic ☐ Irrigation ☐ Test ☐ Municipal
☐ Industrial ☐ Stock ☐ Waste Disposal or Injection
☐ Other _____ (specify type)

4. METHOD DRILLED

☒ Rotary ☐ Air ☐ Hydraulic ☐ Reverse rotary
☐ Cable ☐ Dug ☐ Other _____

5. WELL CONSTRUCTION

Casing schedule: ☒ Steel ☐ Concrete ☐ Other _____

Thickness	Diameter	From	To
.250 inches	6 inches +	2 feet	24 feet
_____ inches	_____ inches	_____ feet	_____ feet
_____ inches	_____ inches	_____ feet	_____ feet
_____ inches	_____ inches	_____ feet	_____ feet

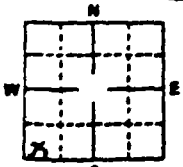
Was casing drive shoe used? ☒ Yes ☐ No
Was a packer or seal used? ☐ Yes ☒ No
Perforated? ☐ Yes ☒ No
How perforated? ☐ Factory ☐ Knife ☐ Torch
Size of perforation _____ inches by _____ inches

Number	From	To
_____ perforations	_____ feet	_____ feet
_____ perforations	_____ feet	_____ feet
_____ perforations	_____ feet	_____ feet

Well screen installed? ☐ Yes ☒ No
Manufacturer's name _____
Type _____ Model No. _____
Diameter ___ Slot size ___ Set from _____ feet to _____ feet
Diameter ___ Slot size ___ Set from _____ feet to _____ feet
Gravel packed? ☐ Yes ☒ No ☐ Size of gravel _____
Placed from _____ feet to _____ feet
Surface seal depth 24 Material used in seal: ☐ Cement grout
☒ Bentonite ☐ Puddling clay ☒ Cuttings
Sealing procedure used: ☐ Slurry pit ☐ Temp. surface casing
☒ Overbore to seal depth
Method of joining casing: ☐ Threaded ☒ Welded ☐ Solvent Weld
☐ Cemented between strata
Describe access port _____

6. LOCATION OF WELL

Sketch map location must agree with written location.



Subdivision Name _____
Lot No. _____ Block No. _____
County Shoshone
SW ¼ SW ¼ Sec. 15 T. 45 ☒N ☐S, R. 5 ☒E ☐W.

7. WATER LEVEL

Static water level 16 feet below land surface
Flowing? ☐ Yes ☒ No G.P.M. flow _____
Artesian closed-in pressure _____ p.s.i.
Controlled by ☐ Valve ☒ Cap ☐ Plug
Temperature cold °F Quality good
(Describe artesian or temperature zones below)

8. WELL TEST DATA

☐ Pump ☐ Bailer ☒ Air ☐ Other _____

Discharge G.P.M.	Pumping Level	Hours Pumped
15	Variable	½ hr

9. LITHOLOGIC LOG

Bore Diam.	Depth From	Depth To	Material	Water Yes	Water No
8	0	16	Clay and Shale		X
	16	24	Shale		X
6	24	175	Shale	X	

RECEIVED
JUN 17 1985
Department of Water Resources
Northern District Office

10. Work started 6/11/85 finished 6/12/85

11. DRILLERS CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Associated Well Drillers Inc Firm No. 245

Address Box 723 C.D.A. Date 6/13/85

Signed by (Firm Official) _____

and

(Operator) Robert F Wright

USE ADDITIONAL SHEETS IF NECESSARY - FORWARD THE WHITE COPY TO THE DEPARTMENT

PAL 002226

3.

USE TYPEWRITER OR BALL POINT PEN

State of Idaho
Department of Water Administration

WELL DRILLER'S REPORT

State law requires that this report be filed with the Director, Department of Water Administration within 30 days after the completion or abandonment of the well.

1. WELL OWNER

Name B.N.R. INC.

Address ANERY IDAHO
Burlington Northern Inc.
650 Central Bldg.
Seattle, Wa. 98104

2. NATURE OF WORK

☑ New well ☐ Deepened ☐ Replacement

[illegible]

3. PROPOSED USE

☑ Domestic ☐ Irrigation ☐ Test ☐ Other (specify type)

☐ Municipal ☐ Industrial ☐ Stock ☐ Waste Disposal or Injection

4. METHOD DRILLED

☐ Cable ☑ Rotary ☐ Dug ☐ Other

5. WELL CONSTRUCTION

Diameter of hole 6 inches Total depth 125 feet

Casing schedule ☑ Steel ☐ Concrete

Thickness		Diameter		From		To	
.250	inches	6	inches	+2	feet	22	feet
.250 PVC	inches	4	inches	35	feet	125	feet
	inches		inches		feet		feet
	inches		inches		feet		feet
	inches		inches		feet		feet

Was a packer or seal used? ☐ Yes ☑ No

Perforated? ☑ Yes ☐ No

How perforated? ☐ Factory ☐ Knife ☐ Torch

Size of perforation 1/4 inches by 1/4 inches

Number		From		To	
160	perforations	100	feet	125	feet
	perforations		feet		feet
	perforations		feet		feet

Well screen installed? ☐ Yes ☑ No

Manufacturer's name ______

Type ______ Model No. ______

Diameter ___ Slot size ___ Set from ______ feet to ______ feet

Diameter ___ Slot size ___ Set from ______ feet to ______ feet

Gravel packed? ☐ Yes ☑ No Size of gravel ______

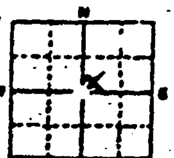
Placed from ______ feet to ______ feet

Surface seal depth 20 Material used in seal ☐ Cement grout ☑ Puddling clay ☑ Well cuttings

Sealing procedure used ☐ Slurry pit ☐ Temporary surface casing ☑ Overbore to seal depth

6. LOCATION OF WELL

Sketch map location must agree with written location.



Subdivision Name ______

Lot No. ______ Block No. ______

County SHOSHONE

SE ¼ NW ¼ Sec. 17, T. 45 N/S, R. 5 E/W

7. WATER LEVEL

Static water level 20 feet below land surface.

Flowing? ☐ Yes ☑ No G.P.M. flow ______

Temperature 40 °F. Quality Good

[illegible]

[illegible] ☐ Cap ☐ Plug

8. WELL TEST DATA

☐ Pump ☐ Bailer ☑ Other AIR

Discharge G.P.M.	Draw Down	Hours Pumped
250 G.P.M.	—	1/2 hrs.

9. LITHOLOGIC LOG

Bore Diam.	Depth From	Depth To	Material	Water Yes	Water No
8	0	23	[illegible] Sand Gravel		✓
6	23	125	[illegible] Quartz Brown-Gray-White-Red Yellow	✓	

10. Work started 12/3/[illegible] finished 12/5/[illegible]

11. DRILLERS CERTIFICATION

Firm Name [illegible] Firm No. 186

Address [illegible] Date [illegible]

Signed by (Firm Official) [signature]

and

(Operator) [signature]

USE ADDITIONAL SHEETS IF NECESSARY — FORWARD THE WHITE COPY TO THE DEPARTMENT

PAL 002227

4.

USE TYPEWRITER OR BALLPOINT PEN

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

WELL DRILLER'S REPORT

State law requires that this report be filed with the Director, Department of Water Resources within 30 days after the completion or abandonment of the well.

1. WELL OWNER

Name: Potlatch Corp. Northern Unit Logging
Address: Box 386 St. Maries, Idaho 83861
Owner's Permit No.

2. NATURE OF WORK

☒ New well ☐ Deepened ☐ Replacement
☐ Abandoned (describe method of abandoning)

3. PROPOSED USE

☐ Domestic ☐ Irrigation ☐ Test ☐ Municipal
☐ Industrial ☐ Stock ☐ Waste Disposal or Injection
☒ Other Commercial Logging camp (specify type)

4. METHOD DRILLED

☒ Rotary ☐ Air ☐ Hydraulic ☐ Reverse rotary
☐ Cable ☐ Dug ☐ Other

5. WELL CONSTRUCTION

Casing schedule: ☒ Steel ☐ Concrete ☐ Other

Thickness		Diameter		From		To	
.250	inches	8	inches +	1	feet	28	feet
.250	inches	6	inches	3	feet	67	feet
	inches		inches		feet		feet
	inches		inches		feet		feet

Was casing drive shoe used? ☒ Yes ~~☐ No~~
Was a packer or seal used? ☐ Yes ☒ No
Perforated? ☒ Yes ☐ No
How perforated? ☐ Factory ☐ Knife ☒ Torch
Size of perforation ½ inches by 12 inches

Number		From		To	
60	perforations	47	feet	67	feet
	perforations		feet		feet
	perforations		feet		feet

Well screen installed? ☐ Yes ☒ No
Manufacturer's name
Type Model No.
Diameter Slot size Set from feet to feet
Diameter Slot size Set from feet to feet
Gravel packed? ☐ Yes ☒ No ☐ Size of gravel
Placed from feet to feet
Surface seal depth 18 Material used in seal: ☐ Cement grout ☒ Puddling clay ☐ Well cuttings
Sealing procedure used: ☐ Slurry pit ☐ Temp. surface casing ☒ Overbore to seal depth
Method of joining casing: ☐ Threaded ☒ Welded ☐ Solvent Weld ☐ Cemented between strata
Describe access port welded

6. LOCATION OF WELL

Sketch map location must agree with written location.

N
W E
S

Subdivision Name
Lot No. 1 Block No.
County ~~Shosone~~ Shoshone
¼ ¼ Sec. 16, T. 46 N/S, R. 5 E/W.

7. WATER LEVEL

Static water level 20 feet below land surface.
Flowing? ☐ Yes ☒ No G.P.M. flow
Artesian closed-in pressure p.s.i.
Controlled by: ☐ Valve ☐ Cap ☐ Plug
Temperature cold °F. Quality good

8. WELL TEST DATA

☐ Pump ☐ Bailer ☒ Air ☐ Other

Discharge G.P.M.	Pumping Level	Hours Pumped
50 G.P.M.		

9. LITHOLOGIC LOG

Hole Diam.	Depth From	Depth To	Material	Water Yes	Water No
8	0	18	fill sealed out water	x	
8	18	30	cemented gravel		x
8	30	31	soft area	x	
8	31	57	brown shale		x
8	57	58	fractured area	x	
8	58	60	brown shale		x
8	60	61	fractured area	x	
8	61	64	brown shale		x
8	64	67	fractures areas	x	

RECEIVED
Department of Water Resources
Northern District Office

10. Work started 11/16/79 finished 11/26/79

11. DRILLERS CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Firm Name American Drilling Firm No. 269
Address P.O. Box 14977 Spokane Date 12/10/79
Signed by (Firm Official) [signature]
and
(Operator) B.O. Murphy

USE ADDITIONAL SHEETS IF NECESSARY — FORWARD THE WHITE COPY TO THE DEPARTMENT

00 [redacted] yds downstream roughly well still in use. well routinely tested.

PAL 002228

Attachment 4

HART CROWSER

h and Environmental Technologies

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
FAX 206.328.5581
206.324.9530

J-2296-02

August 23, 1989

Mr. Mike Fish
Potlatch Corporation
Northern Woodlands Division
P.O. Box 386
Saint Maries, Idaho 83861

Re: Avery Idaho Site
Preliminary Environmental Service
Task 2 - Regulatory Assessment

Dear Mr. Fish:

This letter report presents our findings for Tasks 1 and 2 of the above referenced project. We performed this work per our signed contract dated July 19, 1989, and referenced as Hart Crowser Job J-2296-02.

Our work included:

Task 1

- Obtain samples of waste oils from monitoring well MW-11 on-site and any other available sources; and

- Analyze the sample for chlorinated volatiles, cadmium, chromium, lead, and PCBs.

Task 2

- A preliminary assessment of how recovered oily wastes may be regulated;

- A regulatory assessment of possible disposal options for the oily wastes that may be collected from this site cleanup; and

- A general review of other regulatory considerations.

This work was performed and this report prepared in accordance with generally accepted professional practices related to the nature of the work accomplished in the same or similar localities, at the time the services were performed. This letter report is intended for the exclusive use of Potlatch Corporation for specific application to the Avery Idaho site. This report is not meant to represent a legal opinion. No other condition, express or implied, should be understood.

RESULTS OF CHEMICAL ANALYSES

Current information from previous sampling and the Task 1 sampling and analysis indicates the oily materials found floating on the upper saturated soil horizon to be a petroleum product, probably waste oils.

A sample of the floating petroleum product was obtained from monitoring well MW-11 during a site visit made on July 26, 1989. No other wells contained floating free phase hydrocarbons at that time. Considerable evidence was observed along the river bank of recent and continuing hydrocarbon seeps along the river bank. However, there was not sufficient flow or accumulation to sample from the seeps. The samples were analyzed using Hart Crowser's FAST mobile laboratory. Results of the chemical analyses performed are summarized on Table 1. The laboratory report is attached. Also shown for comparison purposes are the waste oil specification limits contained in 40 CFR 266 Subpart E.

Table 1 - Chemical Analysis Results and Waste Oil Specification Limits - parts per million (ppm)

Parameter	Concentration in Sample	Specification Limit
Arsenic	NA	5
Cadmium	ND	2
Chromium	20	10
Lead	30	100
Total Halogens	ND	4,000
PCBs	1.4	NS

NA = Not analyzed
ND = Not detected in sample
NS = No specification in 40 CFR 266

These results indicate that the oil is slightly out of specification due to chromium. The sample was not analyzed for arsenic due to limitations of the laboratory, however, based on past history of the site it seems unlikely that arsenic would be a significant factor. There is not a specification limit for PCBs in 40 CFR 266. However, the 1.4 ppm level in this sample is well below regulatory criteria of the Toxic Substances Control Act (TOSCA).

Although the single sample may not be totally representative of the petroleum products which may be recovered by the proposed interception trench, the results are encouraging for reuse as waste oil burned for energy. The high chrome value is still within limits for out of specification oil, or the oil could be blended down as discussed in the following section.

The railroad's past maintenance activities on this site are obviously the most likely source of these oily wastes. These activities would certainly have included oil changing, storage of heating oils and locomotive fuels, and other lubrication and petroleum product related maintenance activities.

PRELIMINARY ASSESSMENT OF RECOVERED OILY WASTES

The definition of a used oil from 40 CFR 266:

"Used oil" means any oil that has been refined from crude oil, used, and as a result of such use, is contaminated by physical or chemical impurities.

Current information suggests that the oily material at the Avery Site is simply "used oil". Based on the sampling information , the oily waste has no detected chlorinated solvents and no significant PCB concentrations. Further, the only heavy metal of significance found was chrome, a common contaminate in used oils. Our limited sampling results show no unusual contaminate not common to used oils. Historical knowledge of the site's activities also suggests significant sources of used oils.

REGULATORY ASSESSMENT OF DISPOSAL OPTIONS

Options for the recovered oily waste vary depending on whether it is hazardous or non-hazardous waste. With limited data, the oily waste does not appear to be hazardous, except possibly for chrome. Obvious disposal option are:

- Recycling
  - -Treatment and reuse
  - -Energy recovery by burning

- Treatment
  - -Biological, landfarming

o Disposal
-Incineration

Preliminary screening of the above options for cost, long term liability, permanence of solution, and ease of implementation (both physically and regulatory) concluded that energy recovery by burning effective met all the criteria.

The following is a brief description of the regulatory decision tree for oily waste (used oil) burned for energy recovery.

1. Is the waste a hazardous waste under Subpart O? If the waste has a listed hazardous waste, then it must be sent to a permitted Treatment, Storage, or Disposal (TSD) facility. Our waste predates the lists, and has no known source.

2. Has the waste been mixed with a hazardous waste? If yes, it may be be burned as a hazardous waste fuel, under Subpart D, 40 CFR 266. Our waste has unknown source, so this question is not applicable.

3. Does the oily waste have greater than 1000 ppm total halogens? If yes, 40 CFR 266.40 (c) presumes that the used oil has been mixed with halogenated hazardous wastes. Go to 1. above or rebut this presumption by demonstrating otherwise. Our initial sampling detected no halogens.

- Is the oil waste ONLY as a hazardous waste because of characteristics (e.g., heavy metals), or because of contaminates included from Small Quantity Generators (SQG)? Because we do not know the source of this oil waste, SQG's are not an issue. However, characteristics of chrome could possibly cause our waste to be designated a hazardous waste (based on our limited sampling). If this were the only reason for designation as hazardous waste, it could still be burned using Subpart E standards. If not, go to 2. above.

- Does the oily waste meet the Specifications? The Specification in 40 CFR 266.40 include allowable levels for Arsenic, Cadmium, Chromium, Lead, Flash Point, and Total Halogens. Note our sampling results above.

  A. Yes it does. Then the only management that is required is to keep records and analyze the material. Our waste slightly exceeds the Chrome levels, but you are allowed to blend this waste with other fuels to lower the total blended levels.

  B. No it does not. The used oil fuel will be termed off-specification. 40 CFR 266.41 limits the types and design standards for boilers and industrial furnaces and requires that the burner notify EPA. Also recordkeeping and analysis of above are required.

Options

The oily waste is most likely covered under 5.A. above. There is minimal requirement and the boiler at your facility can be used to burn the waste. Should the waste initially or partially be off-specification, blending with other recovered oily waste or blending with your current fuels may bring it into specification.

Should it be impossible to blend, treat, or process the oily wastes, they may still be marketed to others who may be able to blend before burning, or your boilers or industrial furnaces may meet the more limited boiler/furnace standard listed under 40 CFR 266.41 and 260.10.

OTHER REGULATORY ISSUES

Given the current analytical data, EPA is not likely to be concerned or get involved in this cleanup. Should human health or environmental damage occur, then EPA would reconsider there role. Also should the cleanup stall or slow significantly, EPA may increase their involvement. Their clearest authority to become involved would be through the use of the Clean Water Act as a consequence of seepage into the river.

An emergency cleanup under CERCLA does not appear likely. Petroleum spills are generally exempt from CERCLA. However, should high concentrations of Appendix VIII constituents be discovered, EPA has taken action.

will have

We appreciate the opportunity to assist you on this project. If you have any questions, please call.

Sincerely,

HART CROWSER

RICHARD D. PIERCE
Associate

ALEX TULA
Associate

RDP/AT:jal
L2296Q1A/JOBS

Attachment:

FAST Laboratory Analytical Report

cc: Potlatch Corporation, Lewiston, Idaho,
Attn: William O. Daneworth

Hart Crowser F.A.S.T Laboratory
METALS

Metals analysis is performed using a quick microware digestion, if necessary, to prepare the sample. Quantitation and identification are performed using a flame atomic absorption spectrophotometer (flame AA). Approximate concentrations and tentative identifications derived from this screening method should be confirmed using EPA method 6010 or 7000.

Detection Limits

Metal	Routine Detection Limit ppm in soil	ppb in water
Cadmium	1.5	15
Chromium	0.5	5
Copper	1.0	10
Lead	10	100
Nickel	1.5	15
Zinc	3.6	36

* = Wet Weight Basis

Sample Preperation

A one gm soil sample is placed in a teflon vessel with ten mls of concentrated nitric acid. The vessel is place in a microwave oven for twelve minutes. The vessel is allowed to cool and five mls of concentrated hydrogen peroxide is added. After bubbling ceases the digestate is filtered through 0.45 micron filter paper and diluted to 100 ml.

If digestion is requested for waters, fifty mls of sample is placed in a teflon vessel with three mls of concentrated nitric acid and two mls of hydrochloric acid. The vessel is placed in a microwave oven for thirty minutes. The vessel is allowed to cool, then shaken for thirty seconds and digestate filtered through 0.45 micron filter paper.

MIBK Water Extraction

An alternative method of water sample preparation is by treatment of 100 mls water with seven mls of chelating agent (diethyldithiocarbamate) followed by extraction with fifteen mls of Methyl Isobutyl Ketone (MIBK).

FAST Laboratory Analytical Report

FROM: Thomas Cammarata, Environmental Geochemist
TO: Alex Tula, Associate
DATE: August 1, 1989
SITE: Potlatch
RE: 2296-02
CC: Philip Spadaro, Sr. Project Environmental Chemist

Attached are the compiled results from field screening analysis conducted on one oil sample received on 7/26/89. Screening analysis was performed for PCBs, Chlorinated Screen, and metals (Cd, Cr, and Pb). This report contains:

- Results for 1 oil sample
- Results for 1 method blank
- Results for 1 spike

The appendix to this report contains:

- Detection limits
- A description of the analytical method

Analytical Limitation

Analyses of the samples were performed using screening techniques. Quantitations are estimated, compounds indentification are tentative.

Analytical Comments

Methodologies for analyses of PCBs, chlorinated compounds and metals in oil have been modified from those in the appendix. PCBs were extracted using a one gram sample and no methanol. For chlorinated compounds six tenths of a gram of oil was extracted into 3 ml of methanol. An ali quot of the extract was then taken into 15 ml of carbon free water. Metals were prepared using a half gram of oil into 12 ml of concentrated nitric acid.

The metals analysis data for oil does not reflect the total metal content of the oil. After sample digestion and prior to analysis, the digestate is filtered. Filtering removes material which may contain metals.

Analytical Results

Sample	Analysis	Matrix	mg/Kg
mw-11	Cd	oil	-
mw-11	Cr	oil	20
mw-11	Pb	oil	30
mw-11	PCBs	oil	1.4
mw-11	Chlorinated Volatiles	oil	-

- = below detection limits
All quantitation are estimates
All identifications are tentative

Quality Control

Sample	Analysis	mg/Kg	% Rec
Method Blank	Cd	-	
	Cr	0.48	
	Pb	1.9	
Method Blank	PCBs	-	
Method Blank	Chlorinated Volatiles	-	
mw-11	Cd		91
mw-11	Cr		109
mw-11	Pb		91
mw-11	PCBs		65

%Rec = percent spike recovery
- = below detection limits

Hart Crowser F.A.S.T. Laboratory
VOLATILES SCREEN

Volatiles are analyzed using an automated headspace system connected to a gas chromatograph. Compounds are detected with a Photon Ionization Detector (PID) and an Electrolytic Conductivity Detector (Hall or ELCD). Approximate concentrations and tentative identifications derived from this screening method should be confirmed using EPA method 601, 602, 624, 8010, 8015, 8020, or 8240.

Detection Limits

Compound	Routine Detection Limits* ppb in soil	water
Methylene Chloride	20	20
1,1-Dichloroethylene	20	20
1,1-Dichloroethane	20	20
Chloroform	10	10
Carbon Tetrachloride	10	10
1,2-Dichloropropane	20	20
Trichloroethylene	10	10
1,1,2-Trichloroethane	10	10
Dibromochloromethane	20	20
Tetrachloroethylene	10	10
Chlorobenzene	20	20
Trichlorofluoromethane	10	10
trans-1,2-Dichloroethylene	20	20
1,2-Dichloroethane	20	20
1,1,1-Trichloroethane	10	10
Bromodichloromethane	20	20
cis and trans-1,3-Dichloropropene	40	40
Bromoform	40	40
1,1,2,2-Tetrachloroethane	20	20
Benzene	10	10
Toluene	10	10
Ethylbenzene	10	10
Xylenes	10	10

* = Wet Weight Basis

Volatiles Screen

Sample Extraction Technique

Fifteen gms of soil or 15 ml of water are placed in a 20 ml headspace vial. Carbon free water saturated with sodium sulfate is added to soils until a set volume of headspace is left in each vial. Sodium sulfate is added to each water sample vial to assist in developing the headspace. Soil samples are shaken after capping. The vials are heated prior to analysis in an automated

Hart Crowser F.A.S.T. Laboratory
PESTICIDE / PCBs SCREEN

Polychlorinated Biphenyls (PCBs) and Pesticides are analyzed using a simple solvent extraction and acid cleanup procedure to prepare the sample. Quantitation and identification are performed using a gas chromatograph (GC) with an Electron Capture Detector (ECD). Approximate concentrations and tentative identifications derived from this screening method should be confirmed using EPA method 608, 612, 617, 625, 8120, or 8270.

Detection Limits

Compound	Routine Detection Limits* ppb in soil	water
Aroclor 1016	500	4.0
Aroclor 1221	500	4.0
Aroclor 1232	500	4.0
Aroclor 1242	500	4.0
Aroclor 1248	200	2.0
Aroclor 1254	200	2.0
Aroclor 1260	200	2.0
Aroclor 1262	200	2.0
Aldrin	20	0.1
alpha-BHC	20	0.1
beta-BHC	20	0.1
gamma-BHC (Lindane)	20	0.1
delta-BHC	20	0.1
4,4'-DDD	30	0.2
4,4'-DDE	30	0.2
4,4'-DDT	30	0.2
Dieldrin	30	0.2
Endosulfan I	20	0.1
Endosulfan II	30	0.2
Endosulfan Sulfate	30	0.2
Endrin	30	0.2
Endrin Aldehyde	30	0.2
Heptachlor	20	0.1
Heptachlor Epoxide	20	0.1

* = Wet Weight Basis

Sample Extraction Technique

Five gms of soil are placed in culture tube. One half ml of methanol is added to bind water. Five mls of hexane are added to the sample. The tube is capped and agitated for fifteen minutes. The tube is then placed in a centrifuge to settle particulates and seperate the phases.

For PCB analysis, a two ml aliquot of the extract is transferred to a second container. One ml of concentrated sulfuric acid is added and the extract agitated. The vessel is placed in a centrifuge to settle the acid.

For pesticide analysis acid cleanup procedure is not used. Acid causes degradation of some pesticides.

Analytical Equipment

Analysis is performed using a Hewlett Packard 5890A gas chromatograph with an autosampler. The analytical column is a fused silica capillary column. The detector is an Electron Capture Detector (ECD). Sample capacity 35 samples per day.

Identification and Quantitation

Identification of PCBs are made by comparison to chromatograms of PCB standards analyzed on our GCs. All identifications are tentative. Quantitation of PCBs are made using a single concentration calibration standard for each PCB and five characteristic peaks for each standard. All quantitations are estimates.

Identification of pesticides are made by retention time comparisons to standards run during the analytical sequence. All identifications are tentative. Quantitation of volatiles are made using a single external concentration calibration standard. All quantitations are estimates.

Quality Control

Method blank	One per day or matrix
Matrix spike	One per 20 samples, sample set or matrix
Duplicate	One per 20 samples, sample set or matrix.
Target QC Values	Recovery +/- 50% Relative Difference <25%
Confirmation Samples	Recommend 10 to 20% samples split to confirming lab.

Spectrophotometer

Analysis of soil, water and MIBK extracted water samples is performed on a Perkin Elmer 2380 Flame Atomic Absorption Spectrophotometer. Sample capacity for flame AA performing a single metal analysis is 50 samples per day.

Identification and Quantitation

Samples are analyzed at the primary absorption frequency of the metal specific hollow cathode lamp. A single standard is analyzed at a concentration within the proven linear range of the instrument and or sufficient to give an absorbance of 0.2. All quantitations are estimates.

Quality Control

Method blank	One per day or matrix
Matrix spike	One per 20 samples, sample set or matrix
Duplicate	One per 20 samples, sample set or matrix
Target QC Values	Recovery +/- 50% Relative Difference <25%
Confirmation Samples	Recommend 10 to 20% samples split to confirming lab.

HARTCROWSER

Earth and Environmental Technologies

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
FAX 206.328.5581
206.324.9530

J-2296-01

October 27, 1989

Potlatch Corporation
P. O. Box 386
St. Maries, Idaho 83861

Attn: Mr. Mike Fish

Re: Site Exploration Report
Avery Landing Site
Avery, Idaho

Dear Mr. Fish:

Hart Crowser, Inc., is pleased to submit this letter report for work completed to date at the Avery Landing site in Avery, Idaho. Our work was completed as outlined in Task 1 of our revised scope of work letter dated June 30, 1989. Additional water and product sampling was completed as discussed in our memorandum to Mr. Mike Fish of Potlatch Corporation dated September 15, 1989.

The scope of Task 1 work involved monitoring well installation, groundwater and free-phase hydrocarbon sampling, and laboratory analysis. Field sampling of

free-phase hydrocarbons was not completed during our August site visit due to absence of free product in the newly installed wells at that time. Product sampling was completed during our September visit.

The purpose of our field work to date has been to determine the extent of the free-phase hydrocarbon lens and potential groundwater contamination. Water and free product samples were analyzed to determine the level of dissolved hydrocarbons in the groundwater and the suitability of the hydrocarbon material for burning as boiler fuel.

The following report will cover:

- Monitoring well installation;
- Groundwater and free-phase hydrocarbon sampling;
- Laboratory analysis results; and
- Conclusion and recommendations.

Appendix A contains a discussion of field procedures and well installation logs. Laboratory analysis certificates are presented in Appendix B.

Installation of Monitoring Wells

Four monitoring wells were installed at the Avery Landing site on August 22 and 23, 1989. The Hart Crowser on-site representative was Bruce McDonald, Senior Staff Engineering Geologist. The subcontracted drillers were Soil Sampling Service of Puyallup, Washington. All drilling was completed with air rotary drilling methods. Monitoring well locations are shown on Figure 1. Well construction data are presented on Figures A-2 through A-5. A key displaying the symbols used to describe well installation logs is presented on Figure A-1.

Groundwater and Free-Phase Hydrocarbon Sampling

Groundwater samples were collected on August 23, 1989, from each of the four monitoring wells installed by Hart Crowser. Monitoring wells HC-1 and HC-3 had no noticeable sheen on purged water. Heavy sheens were observed on purged water from monitoring wells HC-2 and HC-4, a strong odor was noted from HC-4. Free-phase hydrocarbons were not present in any of the new wells at that time. Water samples from HC-1 and HC-3 were submitted to Analytical Resources Incorporated of Seattle, Washington, under contract with Hart Crowser, for analysis of total petroleum hydrocarbons (TPH) and dissolved metals (arsenic, cadmium, chromium, and lead).

MW's HC-1 through HC-4

A representative from Hart Crowser returned to the Avery Landing site on September 26, 1989. Free-phase hydrocarbons thickness was measured at approximately 4 feet in monitoring well HC-4. Free-phase hydrocarbons were not detected in HC-2 or HC-3. According to trailer park residents living adjacent to the site, monitoring well HC-1 had been removed to repair water and sewer lines.

Groundwater samples were collected from HC-2 and HC-3, purge water from both wells had a slight odor and a light sheen. Samples were analyzed for fuel hydrocarbons using the free-product from HC-4 as a standard. Free-phase hydrocarbons were collected from HC-4 and analyzed for total extraction procedure toxicity (EP Tox) metals, polychlorinated biphenyls (PCBs), polynuclear aromatic hydrocarbons (PNAs), total halogenated hydrocarbons (TOX), total metals and flashpoint.

All samples were submitted to Analytical Resources Incorporated (ARI) for analysis, some analyses were subcontracted by ARI to Spectrum Laboratories, Inc., of Seattle. Sampling procedures may be found in Appendix A.

Laboratory Analysis Results

Groundwater

Water samples collected from HC-1 and HC-3 on August 23, 1989, were analyzed for TPH (EPA Method 418.1) and dissolved

metals. TPH was nondetectable in HC-1 and HC-3, all metals were also nondetectable except arsenic in HC-3 at 0.009 parts per million (ppm).

Water samples collected September 26, 1989, from HC-2 and HC-3, were analyzed for fuel hydrocarbons by Gas Chromatograph (EPA Method 8015) using the free-phase hydrocarbons from HC-4 as a standard. Fuel hydrocarbons were nondetectable in both samples.

Table 1 summarizes the groundwater analysis results. Laboratory data sheets may be found in Appendix B.

Free-phase Hydrocarbons

Analysis of free-phase hydrocarbons in HC-4 resulted in nondetectable concentrations of all PNA compounds, PCBs, and total halogenated hydrocarbons. All EP Tox metals were also nondetectable except for barium at 0.005 ppm. The flash point of the free-phase hydrocarbons is reported as greater than 210 degrees Fahrenheit. The sample was also analyzed for total metals: cadmium (not detected), chromium (1 ppm), lead (5 ppm), and arsenic (not detected).

Potlatch Corporation
October 27, 1989

CONCLUSIONS AND RECOMMENDATIONS

The analytical results indicate the following:

- The groundwater in well HC-1 at the west property line does not appear to be impacted by the petroleum hydrocarbons;
- The majority of the free-phase petroleum appears to lie beneath the eastern part of the site;
- The free-phase petroleum is not a characteristic hazardous waste as determined by the EP Toxicity test as defined under federal law;
- The free-phase petroleum appears suitable for use by burning for fuel in energy recovery boilers;
- Our prior concept for an interception recovery trench to prevent migration of the petroleum to the St. Joe River still appears appropriate and practical.

Our work has been performed in accordance with generally accepted professional practices in the same or similar localities, related to the nature of the work accomplished at the time the services were performed. It is intended for the exclusive use of Potlatch Corporation, for specific

application to the project site. No other conditions, express or implied, should be understood.

Any questions regarding this report are welcome and should be referred to Alex Tula, Project Manager.

Sincerely,

HART CROWSER, INC.

JERI L. MASSENGILL
Staff Geologist

ALEX TULA
Associate

JLM/AT:cmr/sde
LR22961A/JOBS

Attachments:
Table 1 - Groundwater Analysis Summary
Figure 1 - Site and Exploration Plan
Appendix A - Field Procedures
Figure A-1 - Key to Exploration Logs
Figure A-2 - Well Construction Data
through A-5 for Monitoring Well HC-1 through HC-4
Appendix B - Laboratory Data Sheets
Analytical Resources Incorporated
and Spectra Laboratories, Inc.

Table 1 - Groundwater Analysis Summary

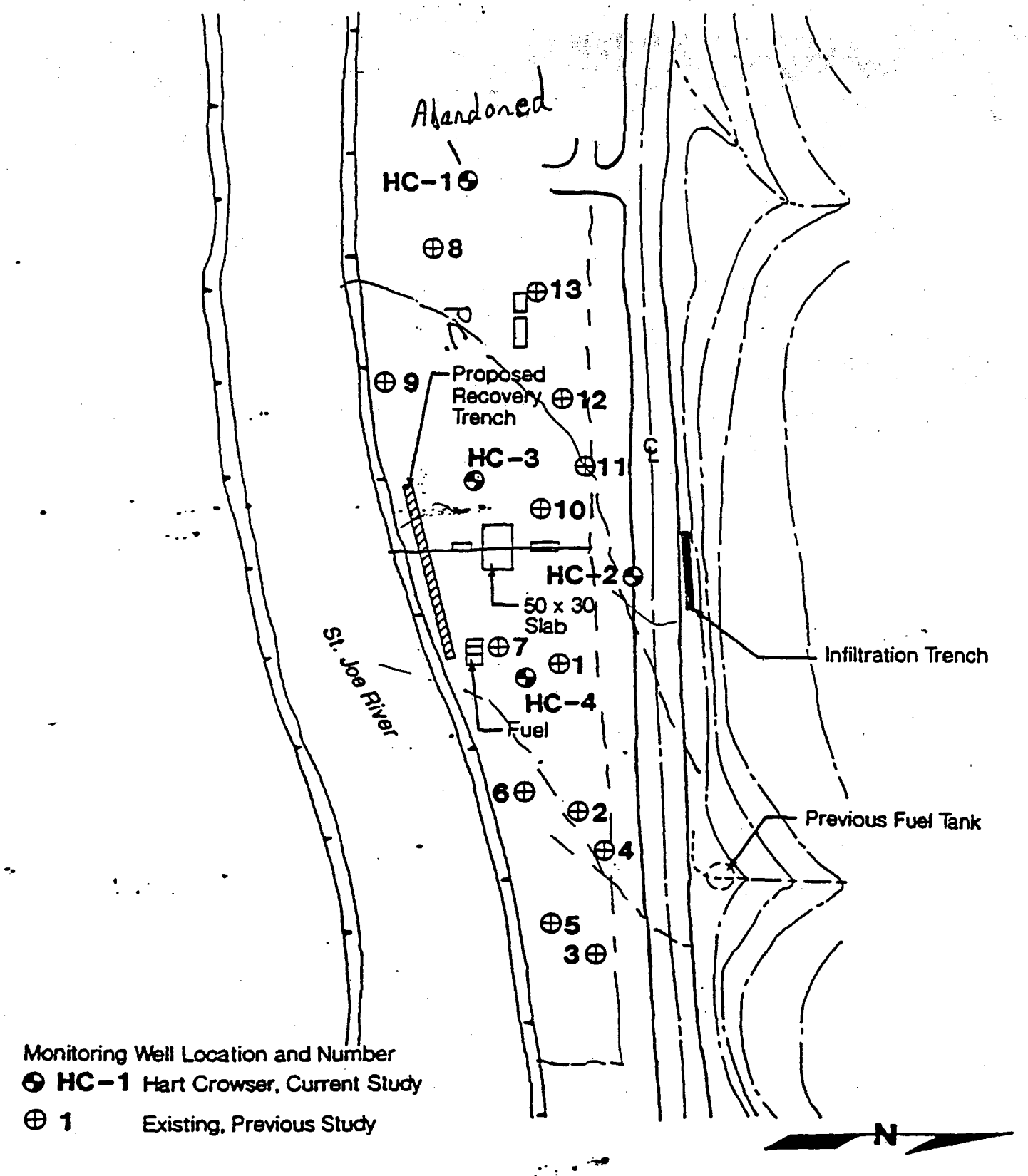
Well	Date Sampled	Analysis Performed		
		TPH	Dissolved Metals	
		(EPA Method 418.1)		
HC-1	August 23, 1989	< 10.0	< 0.001	Arsenic
			< 0.002	Cadmium
			< 0.005	Chromium
			< 0.001	Lead
HC-3	August 23, 1989	< 10.0	0.009	Arsenic
			< 0.002	Cadmium
			< 0.005	Chromium
			< 0.001	Lead
		TPH (EPA Method 8015)		
HC-2	September 26, 1989	< 50.0 *		
HC-3	September 26, 1989	< 50.0 *		

Results reported in parts per million (ppm)

* Analyses performed using free-phase hydrocarbons collected in HC-4 as a standard.

< Not detected at analytical detection limit indicated.

Site and Exploration Plan



HARTCROWSER

J-2296-01 6/89

Figure 1

PAL 002254

APPENDIX A
FIELD PROCEDURES

INTRODUCTION

Field work was completed between August 22, 1989 and September 26, 1989, by Hart Crowser, Inc., and their subcontractor. Hart Crowser's field representatives for this project were Bruce McDonald, Senior Staff Engineering Geologist and Jeri Massengill, Staff Geologist.

Soil Sampling Services, Inc., of Puyallup, Washington, under subcontract to Hart Crowser, completed the drilling and well installation activities on all wells. Groundwater samples were submitted to Analytical Resources, Inc., of Seattle, Washington, for chemical testing.

The program of well installation included the completion of four borings, all of which were completed with air rotary drilling methods using compressed air to lift cuttings from the boring.

The monitoring well locations are presented on Figure 1. Locations were established by hand taping or pacing from existing physical features.

Air Rotary Borings

All borings were completed using percussion bit rotary drilling and air lifted cuttings. Borings were drilled between August 22 and 23, 1989, and completed within a range of depths from 18.5 feet to 23.4 feet below the ground surface. Borings were advanced with a truck-mounted drilling rig using an air-driven percussion bit inside a six-inch inside diameter driven casing. Drilling was accomplished under the continuous observation of a Hart Crowser field representative.

Well Installations

All wells are of 2-inch inside diameter Schedule 40 PVC single well construction and have 10-foot screened sections with 0.020-inch slot size. Wells were installed by lowering the casing to the desired depth. Aqua 8 sand was used to backfill the annulus around the screen to a level 2 feet above the top of the screen. Bentonite chips were used to backfill and grout

the borehole to a depth of 1 foot below the surface. All wells have a concrete surface seal and are protected by either a flush or stickup locking steel monument. Well construction information is presented on Figures A-2 through A-5.

Water Level Measurements

Water level measurements were made for each boring at the time water was first observed during drilling, and immediately prior to placement of the well screen. Subsequent sets of water level measurements were made of all wells installed. These were made before well development and sampling.

Water levels were measured to an accuracy of 0.01 foot using an Olympic Model 300 Electric Well Probe and a decimally graduated tape measure. The tip of the well probe was routinely rinsed with deionized water between wells in order to prevent chemical cross contamination.

Well Development

Development of wells was accomplished by hand bailing. Wells were developed by purging at least four casing volumes of water to remove the fine-grained silt and sand and suspended clay from the well bottom. The wells retained a slight degree of turbidity after development with the exception of HC-3 which remained very turbid.

Groundwater and Free-Phase Hydrocarbon Sampling for Chemical Analysis

Groundwater samples were obtained from the 4 monitoring wells on August 23, 1989. Free-phase hydrocarbon from HC-4 and groundwater samples from HC-2 and HC-3 were collected on September 26, 1989.

Groundwater samples from monitoring wells were obtained using a stainless steel or teflon bailer. To obtain representative groundwater samples, at least 3 casing volumes of water were purged prior to actual sampling. Water was then poured from the bailer into appropriate laboratory provided bottles.

//

Free-phase hydrocarbons were detected in monitoring well HC-4 during our September 26, 1989, visit. HC-4 was not purged prior to sampling; in this case, the free-phase hydrocarbons were poured from a plastic disposable bailer into a laboratory provided bottle.

All samples were labeled and placed on an ice insulated cooler. Sample custody was documented at all times.

Decontamination Procedures

Drilling, sampling, and testing equipment were routinely decontaminated in the field. Decontamination of drilling equipment between explorations consisted of steam cleaning followed by a tap water rinse. PVC components (screen, riser, and end caps) used in well construction were also steam cleaned and rinsed in tap water prior to installation.

The well probe and sampling bailers were decontaminated with a wash of distilled water and detergent followed by two distilled water rinses.

Chain of Custody

All sample jars were prelabeled with well number, job number, date, and the samplers initials. Chain of custody forms were filled out, signed, and countersigned for transfers of samples from the possession of Hart Crowser field representatives to personnel at Analytical Resources, Inc. Chain of custody documents are maintained in the QA/QC records of Hart Crowser.

Key to Exploration Logs

Sample Descriptions

Classification of soils in this report is based on visual field and laboratory observations which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field nor laboratory testing unless presented herein. Visual-manual classification methods of ASTM D 2488 were used as an identification guide.

Soil descriptions consist of the following:
Density/consistency, moisture, color, minor constituents, MAJOR CONSTITUENT, additional remarks.

Density/Consistency

Soil density/consistency in borings is related primarily to the Standard Penetration Resistance. Soil density/consistency in test pits is estimated based on visual observation and is presented parenthetically on the test pit logs.

SAND or GRAVEL Density	Standard Penetration Resistance in Blows/Foot	SILT or CLAY Consistency	Standard Penetration Resistance in Blows/Foot	Approximate Shear Strength in TSF
Very loose	0 - 4	Very soft	0 - 2	<0.125
Loose	4 - 10	Soft	2 - 4	0.125 - 0.25
Medium dense	10 - 30	Medium stiff	4 - 8	0.25 - 0.5
Dense	30 - 50	Stiff	8 - 15	0.5 - 1.0
Very dense	>50	Very stiff	15 - 30	1.0 - 2.0
		Hard	>30	>2.0

Moisture

Dry	Little perceptible moisture
Damp	Some perceptible moisture, probably below optimum
Moist	Probably near optimum moisture content
Wet	Much perceptible moisture, probably above optimum

Minor Constituents

	Estimated Percentage
Not identified in description	0 - 5
Slightly (clayey, silty, etc.)	5 - 12
Clayey, silty, sandy, gravelly	12 - 30
Very (clayey, silty, etc.)	30 - 50

Legends

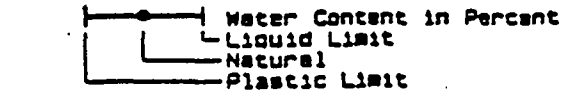
Sampling

BORING SAMPLES

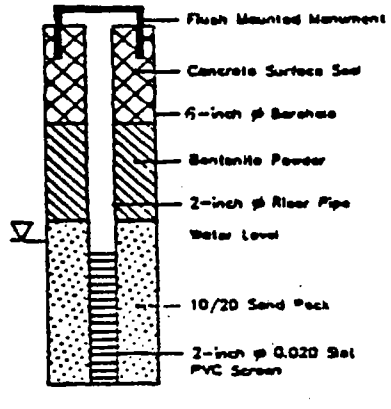
⊠	Split Spoon
⊘	Shelby Tube
▥	Cuttings
◫	Core Run
*	No Sample Recovery
P	Tube Pushed, Not Driven

Test Symbols

GS	Grain Size Classification
CN	Consolidation
TUU	Triaxial Unconsolidated Undrained
TCU	Triaxial Consolidated Undrained
TCD	Triaxial Consolidated Drained
QU	Unconfined Compression
DS	Direct Shear
K	Permeability
PP	Pocket Penetrometer Approximate Compressive Strength in TSF
TV	Torvane Approximate Shear Strength in TSF
CBR	California Bearing Ratio
MD	Moisture Density Relationship
AL	Atterberg Limits



Ground Water Observations



HARTCROWSER

J-2296-01 10/89

Figure A-1

Boring Log and Construction Data for Monitoring Well HC-1

Geologic Log

Depth in feet

Approx. Ground Surface Elevation in Feet

0

Boring drilled with air-rotary equipment
No samples recovered during drilling.

5

10

15

Bottom of Boring at 18.8 Feet.
Completed 8/23/89.

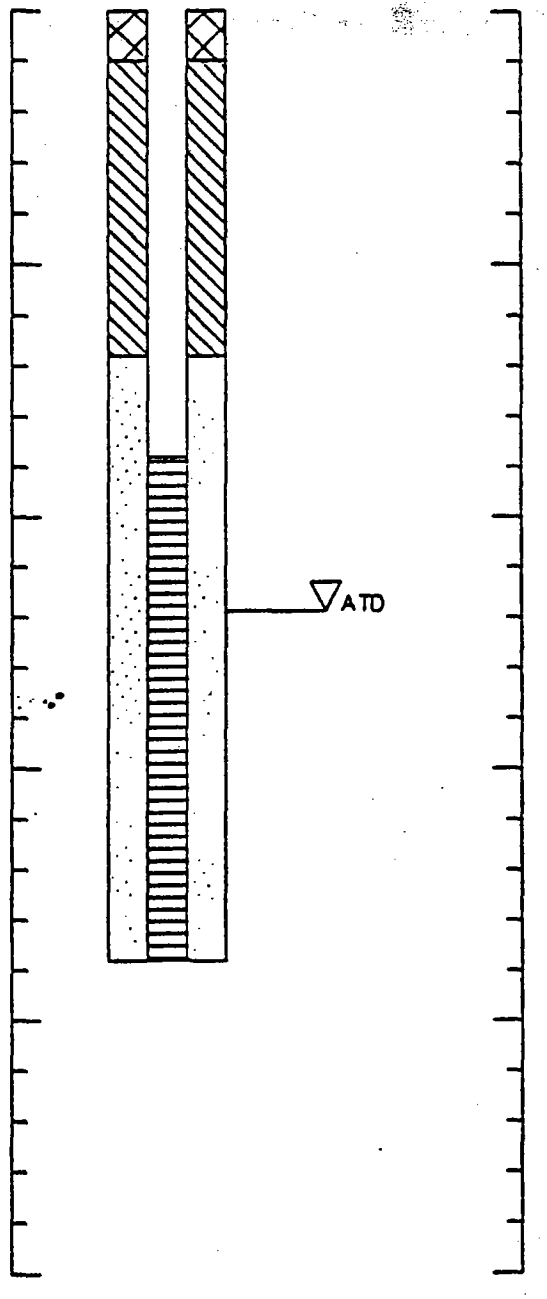
20

25

Sample N

Monitoring Well Design

Casing Stickup in Feet
Top of PVC in Feet 0.00



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

J-2296-01 8/89

Figure A-2

PAL 002259

Boring Log and Construction Data for Monitoring Well HC-2

Geologic Log

Depth in feet

Approx. Ground Surface Elevation in Feet

0

Boring drilled with air-rotary equipment.
No samples recovered during drilling.

5

10

15

20

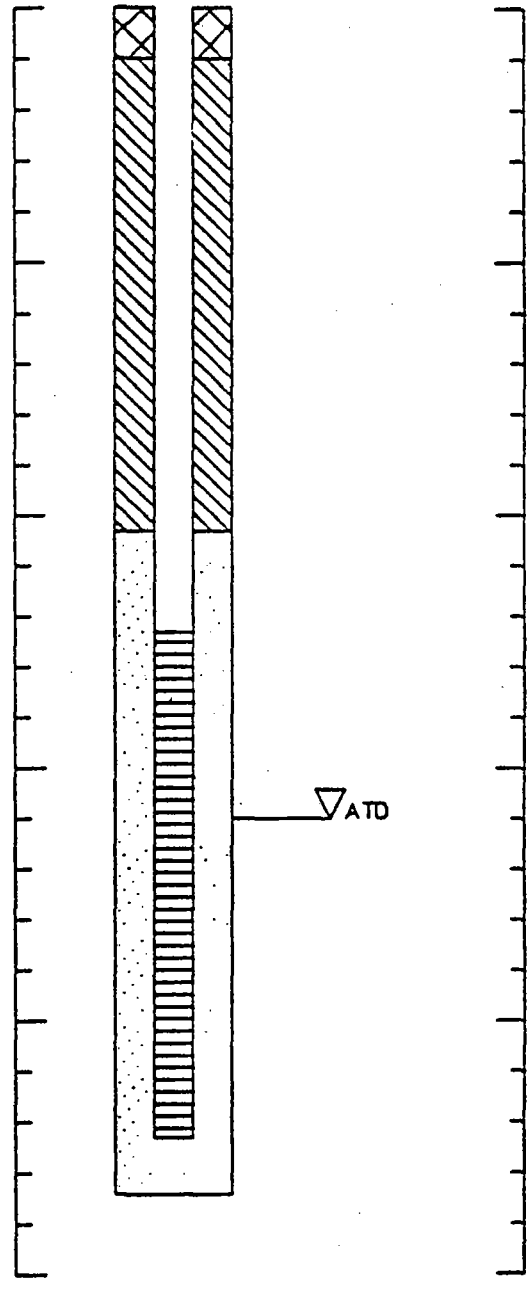
Bottom of Boring at 23.4 Feet.
Completed 8/23/89.

25

Monitoring Well Design

Casing Stickup in Feet
Top of PVC in Feet 0.00

Sample N



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

J-2296-01 8/89

Figure A-3

Boring Log and Construction Data for Monitoring Well HC-4

Geologic Log

Depth in feet

Approx. Ground Surface Elevation in Feet

0

Boring drilled with air-rotary equipment.
No samples recovered during drilling.

5

10

15

Bottom of Boring at 18.5 Feet.
Completed 8/22/89.

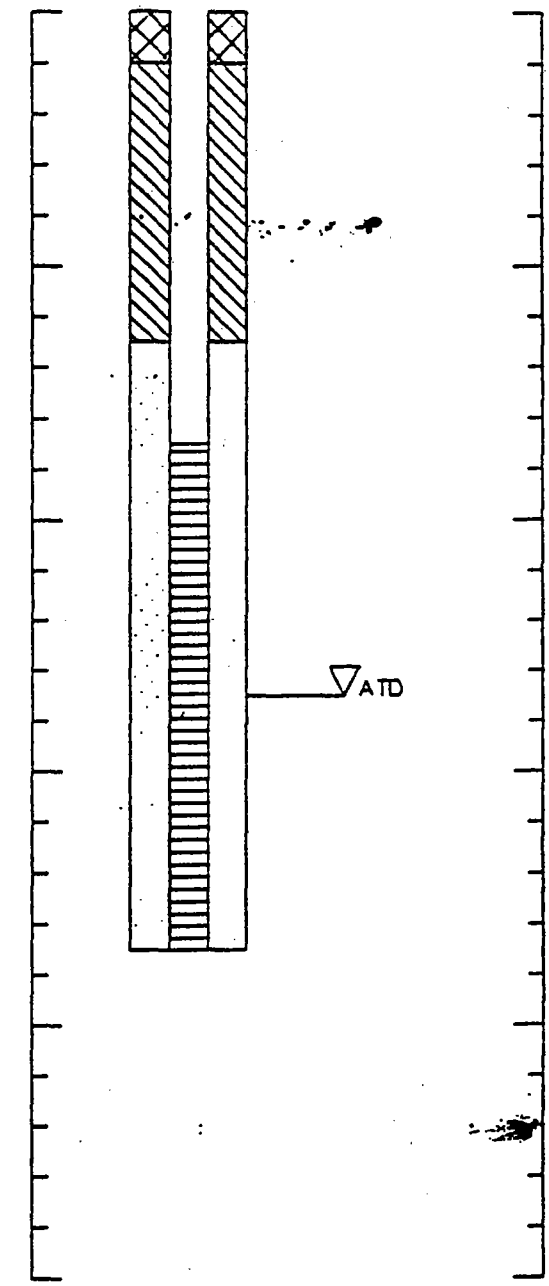
20

25

Sample N

Monitoring Well Design

Casing Stickup in Feet
Top of PVC in Feet 0.00



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

J-2296-01 8/89

Figure A-5

Boring Log and Construction Data for Monitoring Well HC-3

Geologic Log

Depth in feet

Approx. Ground Surface Elevation in Feet

0

Boring drilled with air-rotary equipment.
No samples recovered during drilling.

5

10

15

Bottom of Boring at 18.6 Feet.
Completed 8/23/89.

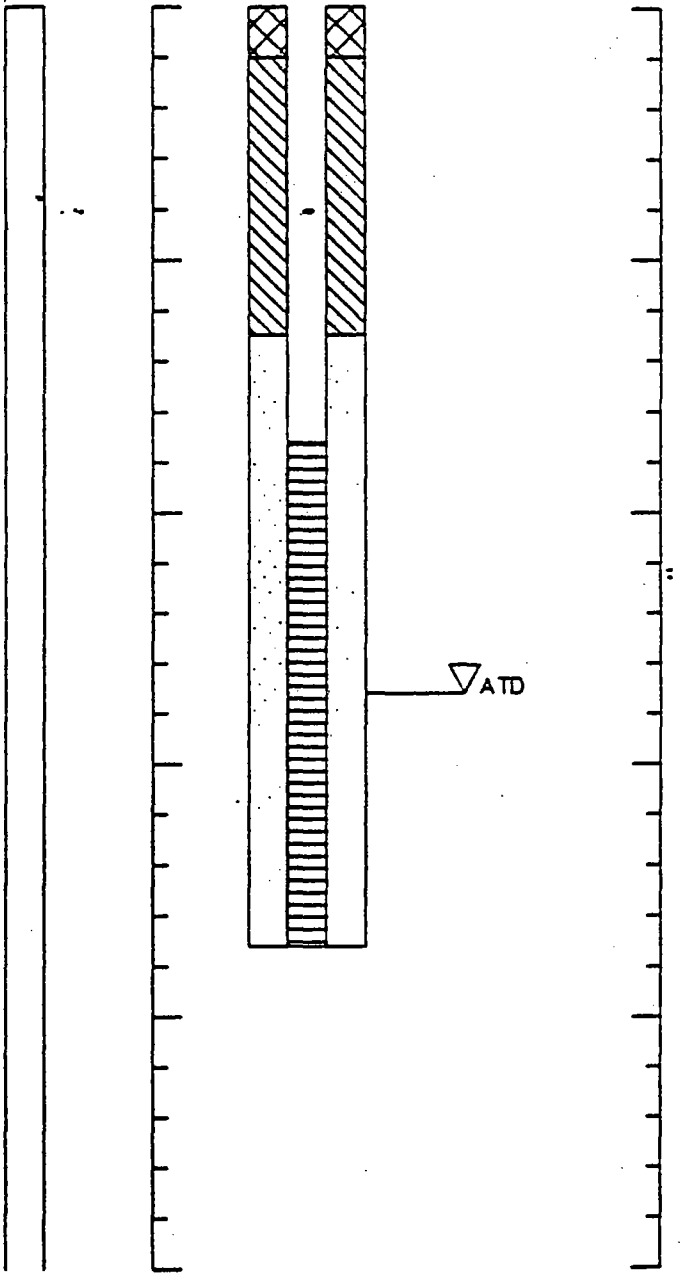
20

25

Monitoring Well Design

Casing Stickup in Feet
Top of PVC in Feet 0.00

Sample N



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

J-2296-01 8/89

Figure A-4

ANALYTICAL
RESOURCES
INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-518
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS by IR Scan
Modified EPA Method 418.1

Matrix: Water

Project: Potlatch Corp.
#J-2296-01
QC Report No: 3540-Hart Crowser
VTSR: 08/28/89

Data Release Authorized _____
Data Prepared: 08/29/89 - MAC:C C.G.

Date of Analysis: 08/29/89
Date Prepared: 08/29/89

	Lab ID	Client Sample ID	Dilution Factor	TPH (ppm)
1	*3540 MB*	*Method Blank*	*1*	10 U
2	3540 A	HC-1	1	10 U
3	3540 B	HC-3	1	10 U

Values reported in ppm (mg/Kg) based on wet weight of sample

U Indicates compound was analyzed for but not detected at the given detection limit.

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
09/05/89
10:58:34

Client: HART CROWSER
Contact: SCOTT FERRIS
Project: POTLATCH CORP
ID number: HC-1
Description:
Sampled: / /
Matrix: WATER

ARI job number: 3540
ARI sample number: A

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-38-2	Arsenic	0.001 mg/L	L	DMN	GFA
7440-43-9	Cadmium	0.002 mg/L	L	DMN	ICP
7440-47-3	Chromium	0.005 mg/L	L	DMN	ICP
7439-92-1	Lead	0.001 mg/L	L	DMN	GFA

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
09/05/89
10:58:41

Client: HART CROWSER
Contact: SCOTT FERRIS
Project: POTLATCH CORP
ID number: HC-3
Description:
Sampled: / /
Matrix: WATER

ARI job number: 3540
ARI sample number: B

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-38-2	Arsenic	0.009 mg/L		DMN	GFA
7440-43-9	Cadmium	0.002 mg/L	L	DMN	ICP
7440-47-3	Chromium	0.005 mg/L	L	DMN	ICP
7439-92-1	Lead	0.001 mg/L	L	DMN	GFA

ANALYTICAL
RESOURCES
INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, Wa 98109-5187
(206) 621-6490

DATA REPORT SHEET
Product Analysis

CLIENT:Hart Crowser
ARI JOB #: 284503747
VTSR: 09/28/89
PROJECT: 2296-02
Avery Landing

ARI SAMPLE #	CLIENT SAMPLE #	Product (ppm)
3747 A	MW-2/S-1	50 UJ
3747 B	MW3/S-1	50 UJ
3747 MB	Method Blank	50 UJ

DATA QUALIFIER

U Indicates compound analyzed for but not detected at the given detection limit.

J Indicates value is estimated, based on results of client-supplied product which was used for a standard.

Date Release Authorized: _____

Report prepared 10/27/89 - MAC:B

SPECTRA Laboratories, Inc.
5013 Pacific Hwy. E. #12 • Tacoma, WA 98424 • (206) 922-5120

October 5, 1989

Analytical Resources Inc.
333 Ninth Ave North
Seattle, WA 98109-5187
Customer #81570

Sample ID: MW 4/S-1
ARI #3747-C
Spectra #26941

Attn: Catherine Greer

Total halogens, ppm	<1
Flash Point, PMCC °F	>210

EP Toxicity Metals, mg/l

Lead	(Pb)	<0.01
Chromium	(Cr)	<0.002
Silver	(Ag)	<0.004
Barium	(Ba)	0.005
Cadmium	(Cd)	<0.005
Arsenic	(As)	<0.08
Mercury	(Hg)	<0.02
Selenium	(Se)	<0.1

SPECTRA LABORATORIES, INC.

Steven G. Hibbs, Chemist

ANALYTICAL
RESOURCES
INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

ORGANICS ANALYSIS DATA SHEET
PCB Analysis

QC Report: 3747-Hart Crowser
Project No: 2296-02/Avery Landing
Date Received: 09/28/89

Matrix: Oil

Data Release Authorized
Report prepared: 10/04/89 - MAC:C

Sulfur Cleaned: NO
Alumina Cleaned: NO
GPC Cleaned: NO

Reported in ppm (mg/Kg)

Sample #:	Method Blk.	MW-4/S-1
ARI Lab ID:	*3747MB*	*3747C*
Date Extracted:	*10/03/89*	*10/03/89*
Date Analyzed:	*10/03/89*	*10/03/89*
Sample Weight:	*5.0 g*	*5.04 g*
Dilution:	*1:40*	*1:40*
1016/1242	1.0 U	2.0 U
1248	1.0 U	2.0 U
1254	1.0 U	2.0 U
1260	1.0 U	2.0 U
DBC %Rec	*55%*	*78%*

Data Reporting Qualifiers

U Indicates compound was analyzed for but not detected at the given detection limit.

NR Indicates compound not reported due to chromatographic interference and/or dilution.

ANALYTICAL
RESOURCES
INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-518
(206) 621-6490
(206) 621-7523 (FAX)

ORGANICS ANALYSIS DATA SHEET- PNA by GC-FID

Lab Sample ID: 3747 C
Matrix: Product

Sample No: MW-4/S-1
QC Report No: 3747-Hart Crowser
VTSR: 09/28/89

Date Extracted: 10/03/89
Date Analyzed: 10/05/89
Conc/Dil Factor: 1:100
Dry Weight: 1.24 grams

Data Release Authorized: _____

REPORT PREPARED: MAC:C - C.G.. (10/05/89)

Reported In ppm(mg/kg)

CAS Number		mg/kg
91-20-3	Naphthalene	1000 U
208-96-8	Acenaphthylene	1300 U
83-32-9	Acenaphthene	1400 U
86-73-7	Fluorene	1300 U
85-01-8	Phenanthrene	1200 U
120-12-7	Anthracene	1000 U
206-44-0	Fluoranthene	200 U
129-00-0	Pyrene	200 U
56-55-3	Benzo(a)Anthracene	200 U
218-01-9	Chrysene	200 U
205-99-2 207-08-9	Benzo(b)Fluoranthene & Benzo(k)Fluoranthene	300 U
50-32-8	Benzo(a)Pyrene	300 U
193-39-5	Indeno(1,2,3-cd)Pyrene	500 U
53-70-3	Dibenz(a,h)Anthracene	500 U
191-24-2	Benzo(ghi)Perylene	600 U

SURROGATE PERCENT RECOVERY	
Terphenyl	103%

Data Qualifiers

U — Indicates compound was analyzed for but not detected at the given detection limit.

NA — Indicates compound not analyzed.

NR — Indicates compound not reported due to dilution and/or matrix interference.

ANALYTICAL
RESOURCES
INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5
(206) 621-6490
(206) 621-7523 (FAX

ORGANICS ANALYSIS DATA SHEET- PNA by GC-FID

Lab Sample ID: 1003MB
Matrix: Product

Sample No: Method Blank
QC Report No: 3747-Hart Crowser
VTSR: 09/28/89

Date Extracted: 10/03/89
Date Analyzed: 10/05/89
Conc/Dil Factor: 1:10
Dry Weight: 4.0 grams

Data Release Authorized: _____

Reported in ppm(mg/kg)

PORT PREPARED: MAC:C - C.G.. (10/05/89)

CAS Number		mg/kg
91-20-3	Naphthalene	2.0 U
208-96-8	Acenaphthylene	2.0 U
83-32-9	Acenaphthene	2.0 U
86-73-7	Fluorene	2.0 U
85-01-8	Phenanthrene	2.0 U
120-12-7	Anthracene	2.0 U
206-44-0	Fluoranthene	2.0 U
129-00-0	Pyrene	2.0 U
56-55-3	Benzo(a)Anthracene	2.0 U
218-01-9	Chrysene	2.0 U
205-99-2 & 207-08-9	Benzo(b)Fluoranthene & Benzo(k)Fluoranthene	3.0 U
50-32-8	Benzo(a)Pyrene	3.0 U
193-39-5	Indeno(1,2,3-cd)Pyrene	5.0 U
53-70-3	Dibenz(a,h)Anthracene	5.0 U
191-24-2	Benzo(ghi)Perylene	6.0 U

SURROGATE PERCENT RECOVERY	
Terphenyl	109%

Data Qualifiers

U — Indicates compound was analyzed for but not detected at the given detection limit.

NA — Indicates compound not analyzed.

NR — Indicates compound not reported due to dilution and/or matrix interference.

SPECTRA Laboratories, Inc.

5013 Pacific Hwy. E. #12 • Tacoma, WA 98424 • (206) 922-5120

October 17, 1989

Analytical Resources Inc.
333 Ninth Avenue North
Seattle, WA 98109-5187
Customer #81570

Sample ID: MW-4/5-1 3747-C
Desc: Oil
Spectra #27474
RUSH

Attn: Dave Mitchell

Cadmium	(Cd), ppm	<1
Chromium	(Cr), ppm	1
Lead	(Pb), ppm	5
Arsenic	(As), ppm	<1

SPECTRA LABORATORIES, INC.

Steven G. Hibbs, Chemist

IDAHO DEPARTMENT OF HEALTH AND WELFARE
BUREAU OF LABORATORIES
2220 Old Penitentiary Road, Boise, Idaho 83712
334-2235

ORGANIC CHEMISTRY REPORT - VOLATILE ORGANIC COMPOUNDS

ample: WATER (HC-4) Log No.: 90-1467

nalyst: W. BAKER Date Analyzed: 10.23.90 Date Reported: 10.26.90

	Results (ug/l)*	Maximum Contaminant Level (ug/l)
THM'S (Trihalomethanes) [Method: 502.2]		
romodichloromethane	u	
romoform		Total THM's
hloroform		100.0
ibromochloromethane		
EGULATED VOC'S [Method: 502.2]		
inyl chloride	u	2.00
,1-Dichloroethylene		7.00
,1,1-Trichlorethane		200.00
arbon tetrachloride		5.00
enzene	58.6	5.00
,2-Dichloroethane	u	5.00
richloroethylene "Trike"		5.00
-Dichlorobenzene		75.00
NREGULATED VOC'S [Method: 502.2]		
romobenzene	u	5.0**
romochloromethane		5.0**
romomethane		5.0**
-Butylbenzene		5.0**
ec-Butylbenzene		5.0**
ert-Butylbenzene		5.0**
hlorobenzene		100.0***
hloroethane		5.0**
hloromethane		5.0**
-Chlorotoluene		5.0**
-Chlorotoluene		5.0**
,2-Dibromo-3-chloropropane (DBCP)		5.0**
thylene dibromide (EDB)		5.0**
ibromomethane		5.0**
-Dichlorobenzene		5.0**
-Dichlorobenzene		600.0***
ichlorodifluoromethane		5.0**
,1-Dichloroethane		5.0**
is-1,2-Dichloroethylene		70.0***
rans-1,2-Dichloroethylene		100.0***
,2-Dichloropropane		5.0***
,3-Dichloropropane		5.0**
2,2-Dichloropropane		5.0**
,1-Dichloropropane		5.0**

(OVER)

OCT 29 1990

PAL 002272

OG NO. 40-1101

	Results (ug/l)*	Maximum Contaminant Level (ug/l)
Ethylbenzene	1.64	700.0***
Hexachlorobutadiene		5.0**
Isopropylbenzene		5.0**
p-Isopropyltoluene		5.0**
Methylene chloride		5.0**
Naphthalene		5.0**
n-Propylbenzene		5.0**
Styrene		5.0**
1,1,1,2-Tetrachloroethane		5.0**
1,1,2,2-Tetrachloroethane		5.0**
Tetrachloroethylene "PERK"		5.0***
Toluene	3.97	2000.0***
1,2,3-Trichlorobenzene		5.0**
1,2,4-Trichlorobenzene		5.0**
1,1,2-Trichloroethane		5.0**
Trichlorofluoromethane		5.0**
1,2,3-Trichloropropane		5.0**
1,2,4-Trimethylbenzene		5.0**
1,3,5-Trimethylbenzene		5.0**
m-Xylene + p-Xylene	U	Total xylenes
o-Xylene	0.88	10000.0***

* All analytical results less than MDL will be listed as U.
** Laboratory assumed MCL (not officially established as MCL by EPA)
*** EPA proposed MCL
U - < MDL (Minimum Detectable Limit)

F1A-OS.SKH

Attachment 5

IDAHO COOPERATIVE FISH AND WILDLIFE RESEARCH UNIT
COLLEGE OF FORESTRY, WILDLIFE AND RANGE SCIENCE
UNIVERSITY OF IDAHO
MOSCOW, IDAHO 83843
(208) 885-6336

April 4, 1991

Clyde Cody
Department of Health and Welfare
Division of Environmental Quality
1410 N. Hilton, Suite 101
Boise, ID 83706-1253

Dear Clyde:

Attached you will find information you can use to calculate fish densities for sections of the St. Joe River up and downstream from Avery. You should be aware that the lower densities of cutthroat trout in the lower St. Joe River is at least partly due to high water temperatures. Most of the Cutthroat Trout move upstream to cooler areas in summer.

Sincerely,

Ted Bjorn

Ted C. Bjornn
Assistant Leader

sw

COOPERATORS:

University of Idaho

very to Prospector Ck. during August, 1989 and 1990.

ransects 29 - 35 = Calder to Avery
ransects 1 - 7 = Avery to Prospector Ck.

Trnsct No.	Trnsct Length(m)	Mean Width(m)	Surface Area(m2)	TOTAL COUNTED AUGUST 1989 CUTT	RAINBOW	BULL T	WF
29	96.0	7.6	731.5	0	0	0	3
30	57.0	9.5	541.5	1	0	0	1
31	92.0	7.6	701.0	0	1	0	5
32	100.0	8.0	800.0	1	0	0	5
33	87.0	8.0	696.0	1	6	0	8
34	166.0	8.0	1328.0	1	5	0	26
35	129.0	8.0	1032.0	3	1	0	11
1	148.0	37.6	5564.8	1	1	0	0
2	204.0	28.4	5793.6	4	2	0	129
3	59.4	12.5	743.0	10	0	0	14
4	40.0	12.8	512.0	8	0	0	9
5	135.0	25.1	3388.5	7	0	0	10
6	243.0	34.7	8432.1	2	12	0	27
7	134.0	32.1	4301.4	19	64	0	13

Trnsct No.	Trnsct Length(m)	Mean Width(m)	Surface Area(m2)	TOTAL COUNTED AUGUST 1990 CUTT	RAINBOW	BULL T	WF
29	96.0	7.6	731.5	0	1	0	10
30	57.0	9.5	541.5	0	2	0	1
31	92.0	7.6	701.0	2	2	0	5
32	100.0	8.0	800.0	0	2	0	7
33	87.0	8.0	696.0	5	20	0	108
34	166.0	8.0	1328.0	2	0	0	125
35	129.0	8.0	1032.0	2	6	0	52
1	148.0	37.6	5564.8	7	7	0	17
2	204.0	28.4	5793.6	13	17	0	217
3	59.4	12.5	743.0	NO DATA DUE TO ROAD CONSTRUCTION			
4	40.0	12.8	512.0	NO DATA DUE TO ROAD CONSTRUCTION			
5	135.0	25.1	3388.5	15	2	0	8
6	243.0	34.7	8432.1	5	91	0	57
7	134.0	32.1	4301.4	20	2	0	12

Fish Production Estimates (using August, 1990 data)

- 15 mile stream segment below Avery includes transects 31-35.

- These transects total 338 fish per 574 meters of stream.

- 15 miles = 24,135 meters

$$\frac{574 \text{ m (transects)}}{24{,}135 \text{ m (total)}} = \frac{338 \text{ fish (transects)}}{X \text{ fish (total)}}$$

$$574x = 8157630$$

$$X \text{ (total fish)} = 14{,}212$$

Divide by 15 miles = 947 fish/mile

Using an average length of 10-12 inches and average weight of $\frac{3}{4}$ lb per fish

.75 lb x 947 fish/mile = 710 lbs fish/mile